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GLENDIVE

TOPICS

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MONTANA DEPARTMENT OF HIGHWAYS
PLANNING RESEARCH BUREAU

By

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Consulting Engineers
Helena, Montana

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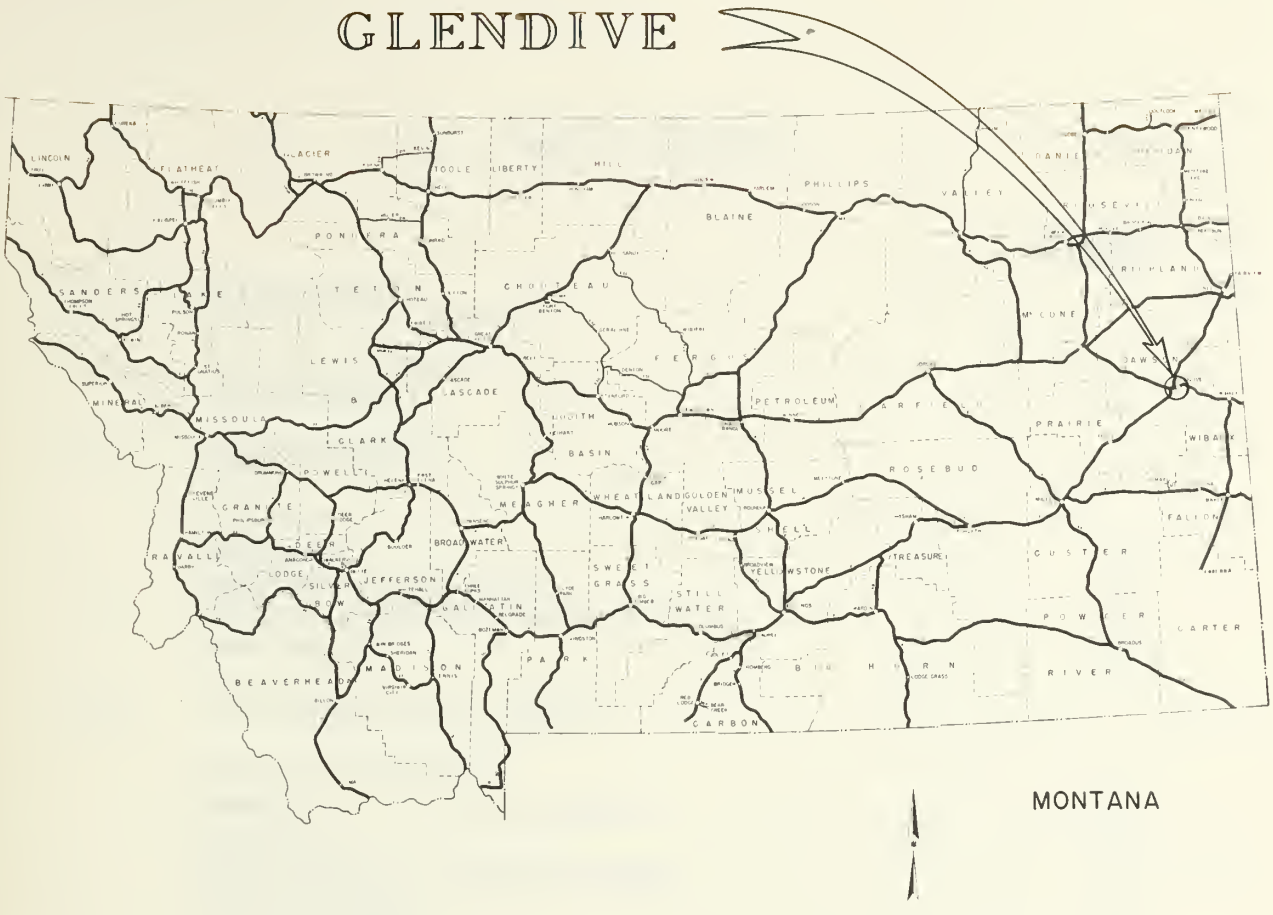


A TRAFFIC OPERATIONS IMPROVEMENT PLAN FOR THE GLENDIVE URBAN AREA

prepared for

Montana Department of Highways - Planning and Research Bureau

in cooperation with

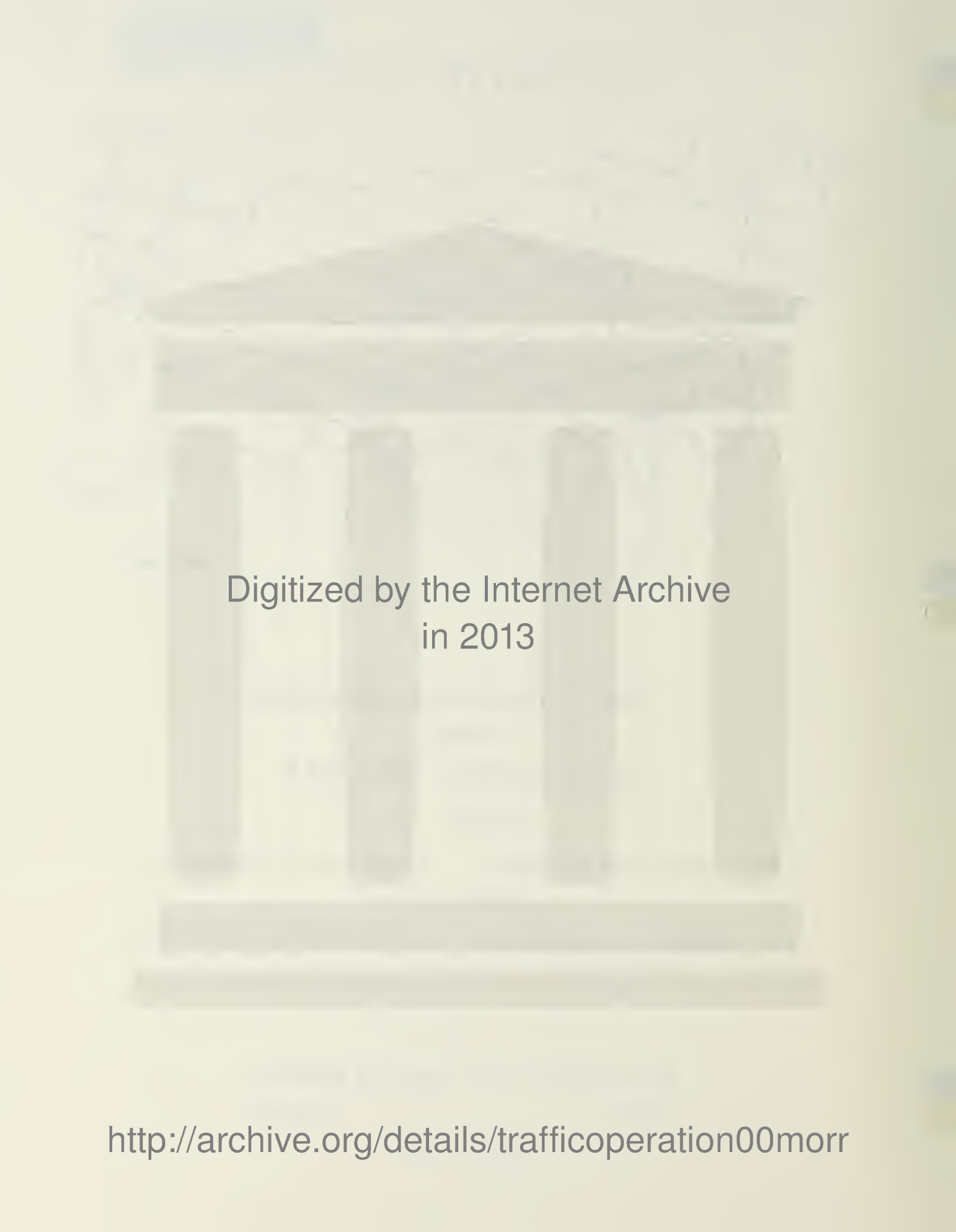
U.S. Department of Transportation - Federal Highway Administration

by

Morrison-Maierle Inc. Consulting Engineers

Helena, Montana

January, 1974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I

INTRODUCTION

THE TOPICS PROGRAM:

This study report is the result of an area wide Traffic Operations Program to Increase Capacity and Safety (TOPICS) on the existing street and road network within the Glendive Urbanized area. Program authority was established by the Congress as part of the Federal Aid Highway Act of 1968 and the guidelines for implementation are outlined in the Federal Highway Administration's Policy and Procedure Memorandum 21-18 dated May 13, 1971.

The program is designed to provide a continuing program within designated urban area boundaries which will develop optimum efficiency from the existing street and road network. The intent of TOPICS is not for major construction, but rather, to provide a systematic means for eliminating existing deficiencies with a minimum of capital outlay. The program is intended to compliment long range improvement proposals and as such must be coordinated with local, state and federal transportation authorities.

The TOPICS program encourages planning for traffic operational improvement projects on the following road systems within the urbanized area:

1. Federal Aid Primary Type I.
2. Federal Aid Secondary.
3. Federal Aid Primary Type II.
    a. These are streets which are not included in either of the first two categories nor are they on the Federal Aid Urban System.

The following general types of improvements may be eligible for TOPICS planning:

1. Traffic control devices and approach lanes.
2. Widening or altering traffic lanes including:
    a. Addition of turning lanes;
    b. Widening created by channelization;
    c. Widening to eliminate bottlenecks.
3. Upgrading traffic control signs.
4. Restricting curb parking.
5. Short construction or reconstruction of streets for route continuity.

The foregoing list is not intended to be complete but should serve to indicate the type of projects intended to be included for traffic operational improvements by the Federal Act. Local officials played an important role in the development of this report.

THE COMMUNITY:

Glendive is located on the Yellowstone River. It is 30 miles from Montana's eastern border. The Yellowstone River was a travel route for early settlers and frontiersmen moving into Montana.

Glendive as a community was established at its present location when the Northern Pacific Railroad was built in 1881. It was moved from an earlier location on Glendive Creek.

Agriculture has always been Glendive's major industry. It began with ranching and dryland farming and in 1904 an irrigation project was completed which has played an important part in the growth of this industry.

POPULATION TRENDS AND PROJECTIONS

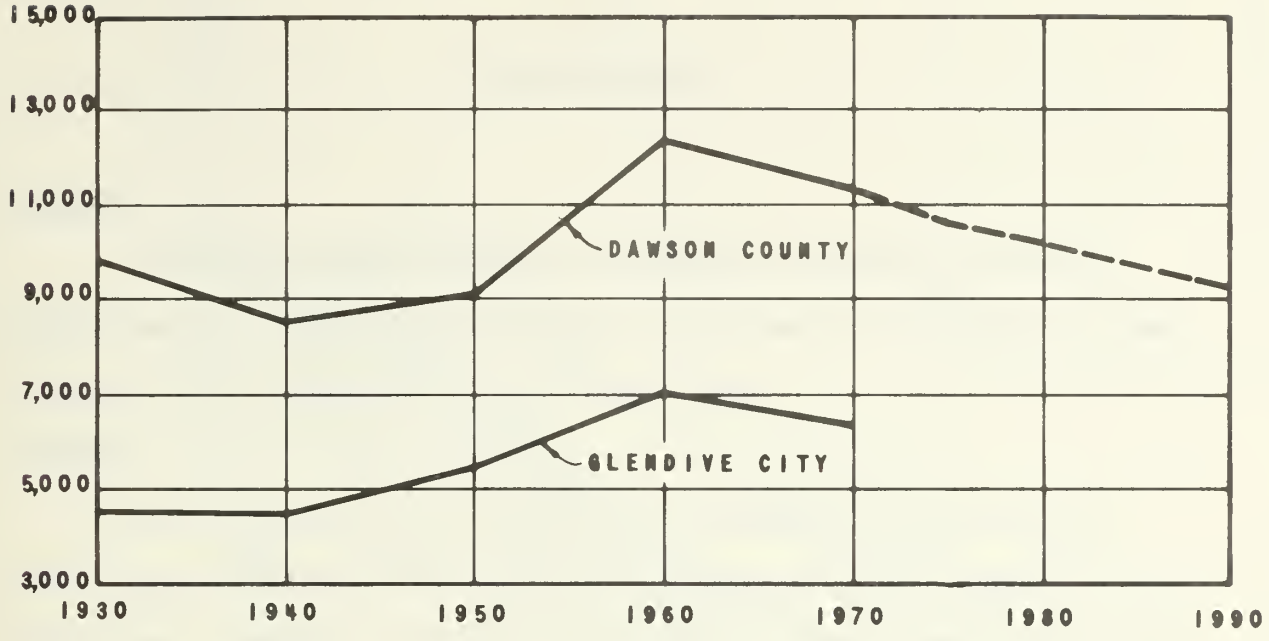


Table I

Glendive was incorporated as a town in 1902, but no major changes occurred until 1946. At this time, Montana-Dakota Utilities established division headquarters for their natural gas transmission and production in Glendive. This has come to be another major industry in the area.

During the 1960's, Glendive Community Hospital was founded and eventually a new hospital facility was built. During this time, a new high school was built and Dawson College moved to its present facilities. During this decade a new airport was built north of Glendive to meet the growing demands and the Interstate System was completed through Glendive adding to the present transportation facilities.

II

STUDY PROCEDURE

GENERAL:

The study procedure basically consisted of inventory, analysis, and evaluation project identification and solutions to correctable problems which fall within the scope of the TOPICS program.

INVENTORY:

Existing data such as the Glendive Comprehensive Plan, current traffic counts and street and road projects which are being planned or are underway were examined to determine what parts of these items could be used for the current study. The purpose of this was to eliminate duplication of effort.

Meetings were held with local officials to acquaint them with the TOPICS program and to obtain data such as accident records, traffic ordinances and any other data which would be available at the local level.

In addition to existing inventory data, machine traffic counts were taken at many locations, turning movement counts were made, accident data was compiled and a sign inventory was taken. Also, physical characteristics of some of the suspected problem areas were obtained and parking at suspected problem locations were examined.

ANALYSIS AND EVALUATION:

The Tentative Federal Aid Primary Type II Road System had been developed and approved by the City of Glendive prior to the initiation of this study. The system was reviewed and some revisions were made. The final approved system is shown on Figure 1. Documentation of the City Council action approving the Type II system is in the appendix.

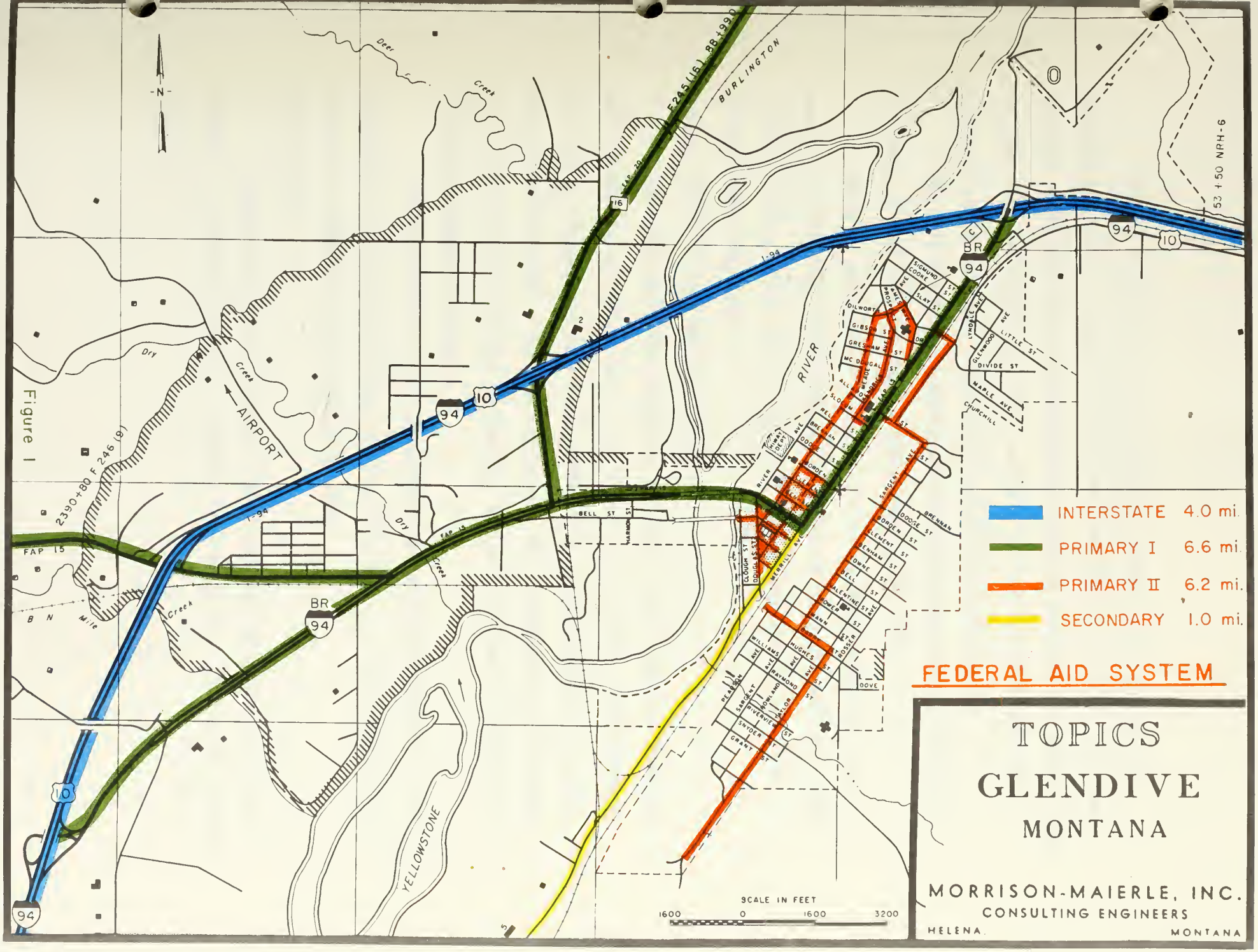


Figure 1
INTERSTATE 4.0 mi.
PRIMARY I 6.6 mi.
PRIMARY II 6.2 mi.
SECONDARY 1.0 mi.
FEDERAL AID SYSTEM
TOPICS
GLENDIVE
MONTANA
MORRISON-MAIERLE, INC.
CONSULTING ENGINEERS
HELENA MONTANA
SCALE IN FEET
1600 0 1600 3200
RIVER
YELLOWSTONE
AIRPORT
BURLINGTON
I-94
BELL ST
FAP 15
F 245(16) BR 199
2390+80 F 246 (9)
53+50 NPH-6

Traffic volumes and turning movement counts were compiled and analyzed and Level of Service factors were computed at selected locations. Accident concentrations were plotted and where the need was indicated, intersections were evaluated for signal warrants and other needed corrective measures such as signing, striping and channelization measures.

The city traffic ordinances were reviewed and compared with the "Uniform Vehicle Code and Model Traffic Ordinance", 1968.

Meetings were held with City officials to obtain local opinion concerning problem areas which might be correctable under the TOPICS program. A field review of each site as well as a general review of the TOPICS street network was made.

PROJECT IDENTIFICATION AND SOLUTIONS:

The sites which would qualify for TOPICS type corrective measures were identified by the process of analyzing and evaluating the inventory data and by discussions with local authorities who are familiar with the city's traffic needs. Alternate solutions were considered and discussed with local officials and the recommended actions are shown in Section IV, TOPICS Improvement Projects.

A priority list of the improvements was prepared showing the relative importance as indicated by Glendive City officials. A preliminary estimate of cost is shown with each proposed project.

SURVEILLANCE:

Recommended surveillance procedures designed to measure the effectiveness of each improvement are described following the "TOPICS Improvements" Section.

III

THE TRANSPORTATION SYSTEM

EXISTING FACILITIES:

The major highway route through Glendive is Interstate 94. This route provides access to Billings and western Montana and to North Dakota to the east. Access to I-94 is provided by three full interchanges and one half diamond.

Two Federal Aid Primary routes also serve Glendive. These are Montana 200 S (FAP 15) to Circle and Montana 16 (FAP 20) to Sidney. FAS 335 runs south from Glendive and provides access to that rural area.

Rail freight service is provided by the Burlington Northern Railroad which runs through Glendive. The Amtrak system provides passenger service to the city.

Two bus lines offer service to Glendive. These are the Greyhound Bus Lines and Neville Transit.

Frontier Airlines provides both passenger and air freight service to the Glendive area.

The Glendive Urban Area is split up into three major areas, and one minor area by natural and manmade features. These are the railroad tracks, the Yellowstone River, and the Interstate.

The railroad bisects the older part of town, and three crossings are provided. The Barry Street Underpass is the only grade separation. The crossings at Allard and Griswold are at-grade crossings.

The Yellowstone River separates the older part of town from the more recent development. The Bell Street and Towne Street bridges provide local access across the river.

The Interstate separates some minor new additions and the airport and Fairgrounds from the rest of the town; however, three Interstate grade separations provide good access to these areas.

AVERAGE DAILY TRAFFIC VOLUMES:

The city of Glendive contains no high density population areas, and most streets carry relatively low traffic volumes. Merrill Avenue and Towne Street do carry proportionately large volumes of through traffic.

Figures 2 and 3 show the average daily traffic volumes for the major streets in Glendive. The counts used to prepare these Figures were taken in the spring and summer of 1973 and were adjusted to an annual average daily traffic. These Figures show the two way traffic on the streets.

The numbers shown on Figures 2 and 3 indicate the location where the count was taken and the number of vehicles at that point.

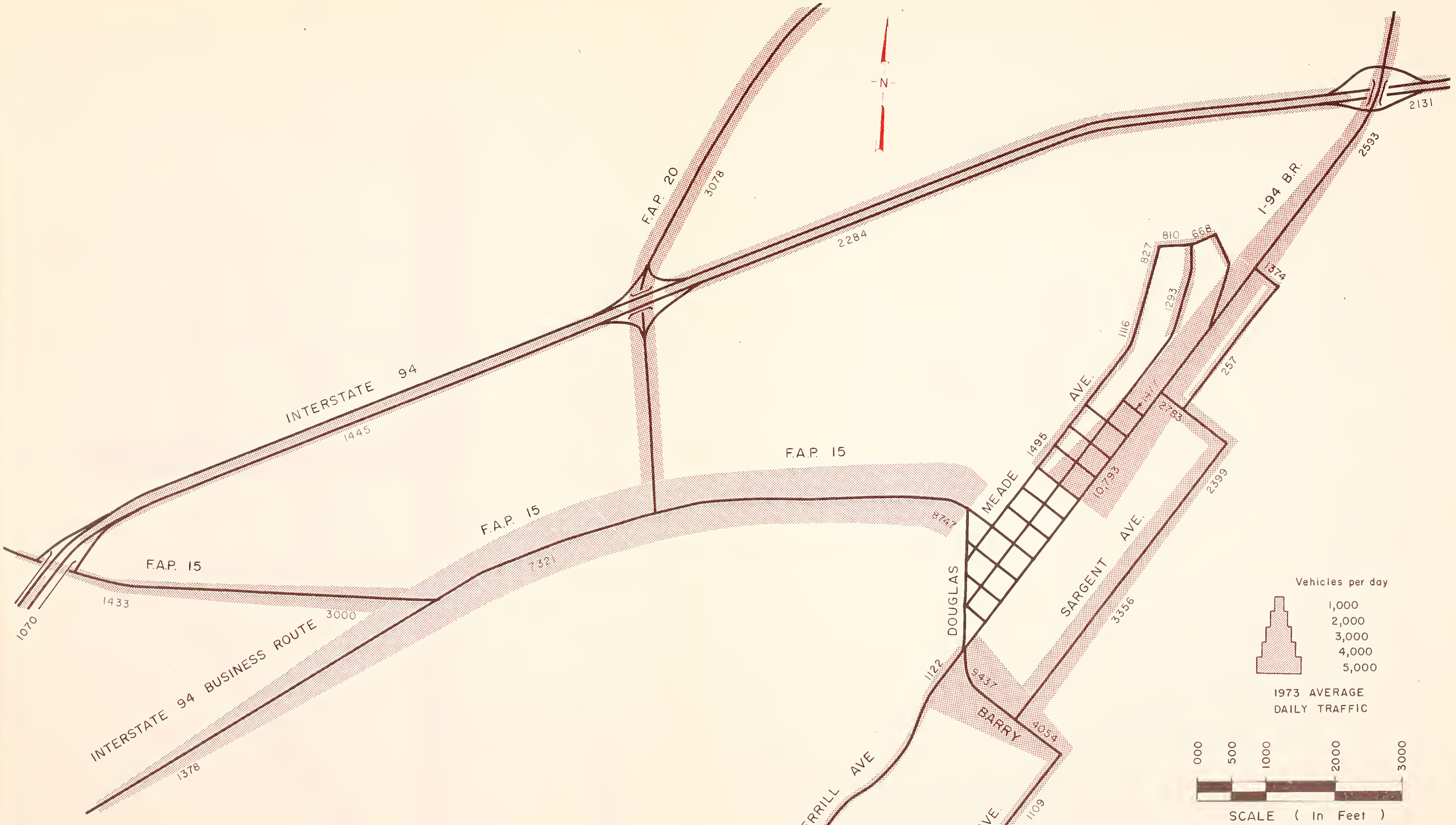
CAPACITY:

The level of service C capacity was calculated for the intersections in Glendive where projects are being recommended and at signalized intersections. None of the approaches were found to have capacity problems. None of the intersections were found to have DV/SVc ratios greater than 1. Table 2 is a list of approaches and their demand volume to service volume ratio at level of service C.

DIRECTIONAL AND TURNING VOLUMES:

Figure 4 shows the approach, turning and departing peak hour volumes for the two streets where projects are being recommended.

This figure was developed from hand counts taken in 1973. They were recorded at 15 minute intervals.



GLENDIVE

TRAFFIC VOLUMES

Figure 2

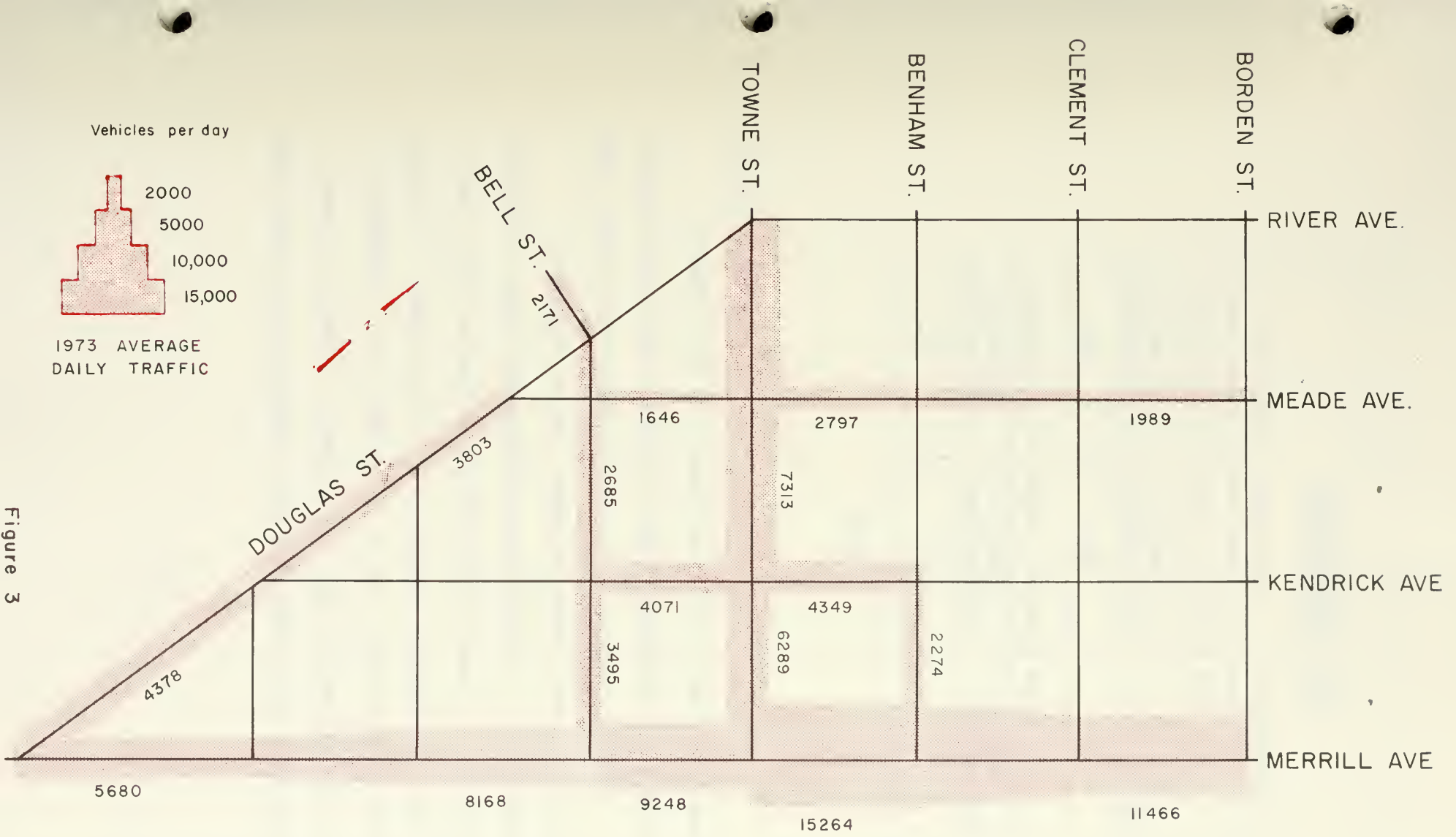


Figure 3

0 200 400 600

SCALE IN FEET

GLENDIVE

CENTRAL BUSINESS DISTRICT

TRAFFIC VOLUMES

Demand Volume / Service Volume ($\frac{DV}{SVc}$) For Glendive Intersections - 5:00-6:00 pm		
Intersection of Merrill Avenue & Bell Street		
On Merrill From the North	On Merrill From the South	On Bell From the West
.69	.56	.31
Intersection of Merrill Avenue & Power Street		
On Merrill From the North	On Merrill From the South	On Power From the West
.60	.43	.11

TABLE 2

TRAFFIC SIGNALS:

Glendive has four operating traffic signals at present. Two of these, Towne Street and Merrill Avenue and Towne Street and Kendrick Avenue, have recently been updated under the State 9999's project.

The signals at Bell Street and Merrill Avenue and at Power Street and Merrill Avenue are obsolete installations. Bell and Merrill was found to meet signal warrants using 1973 traffic counts. The intersection of Power and Merrill does not meet signal warrants and removal of the existing signal is recommended. The location of all the traffic signals and their status is shown on Figure 5. Signals, when they are needed, help to move traffic. When they are not warranted, they slow down traffic without improving safety.

TRAFFIC VOLUMES & TURNING MOVEMENTS

4:00 P.M. TO 5:00 P.M.

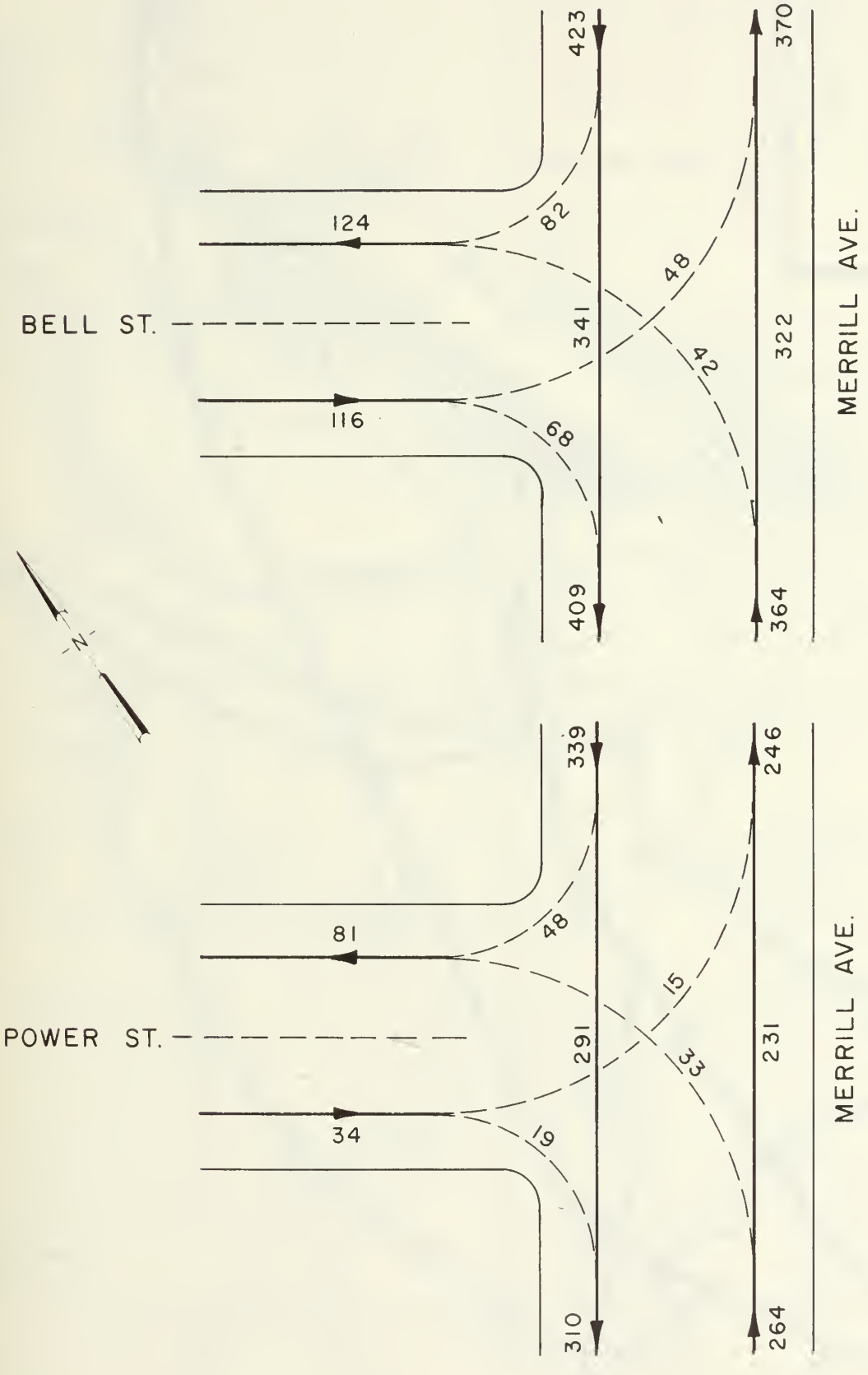


Figure 4

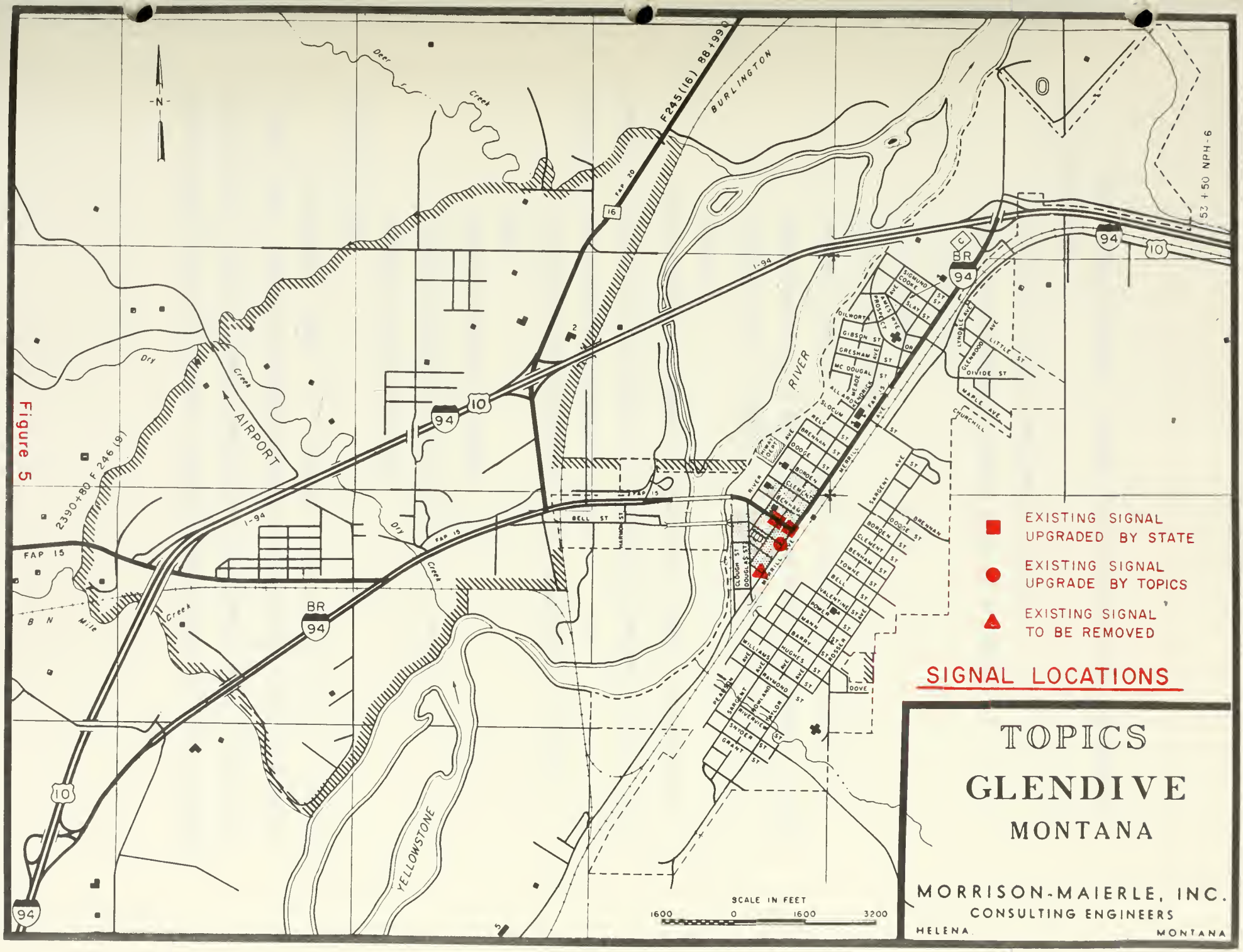


Figure 5
SIGNAL LOCATIONS
EXISTING SIGNAL UPGRADED BY STATE
EXISTING SIGNAL UPGRADE BY TOPICS
EXISTING SIGNAL TO BE REMOVED
SCALE IN FEET
1600 0 1600 3200
TOPICS
GLENDIVE
MONTANA
MORRISON-MAIERLE, INC.
CONSULTING ENGINEERS
HELENA MONTANA
F245(16) 88+990
BURLINGTON
RIVER
AIRPORT
YELLOWSTONE
Deer Creek
Dry Creek
B N Mile
I-94
FAP 15
FAP 16
FAP 20
BR 94
10
16
53 +50 NPH-6
2390+80 F 246 (9)

When warrants are met, a signal installation usually improves the following conditions.

1. Provides for orderly movement of traffic.
2. Reduces the number of certain types of accidents -
   a. Right Angle
   b. Pedestrian
   c. Turning movements.
3. Provides a means of interrupting heavy traffic to allow the other traffic, both vehicular and pedestrian, to enter or cross.
4. Promotes driver confidence by establishing positive right-of-way.

Traffic signals, at unwarranted locations, usually restrict the smooth and orderly flow of traffic for the following reasons. This list is some of the disadvantages of traffic signals:

1. Increases total intersection delay, especially at off peak hours.
2. Increases rearend accidents.
3. Promotes disrespect for signals that are needed.
4. Increases driver irritation.

ACCIDENT SURVEY:

The accident record survey covered a three year period from June 1970 to June 1973. The accidents were recorded as to location, type and date to determine the highest accident locations and to determine which type of accidents occurred most often at each location. The accidents that were recorded

on this survey were those that had over $100 in property damage and/or injury or death. Mid-block accidents were examined, but no concentrations of this type occurred. Table 3, which shows accident rates and total accidents, is based only on accidents which could be attributed to the intersection and no mid-block collisions were used.

Seventeen locations were found to have had more than 8 accidents in this 3 year period. Ten of these locations had more than 5 accidents per year as shown in Figure 6.

Table 3 is a chart showing accident rates at selected intersections. Two values are plotted; the first shows total accidents in the three year period for each intersection and the second shows the accident rate in number of vehicles passing through the intersection per accident. Intersections with low rates, eg. 400,000 vehicles per accident, were suspected of having problems; whereas a high rate such as 1,300,000 vehicles per accident, was considered relatively safe.

These investigations consider such things as:

1. Type of control on the intersection.
2. Sight distance at the intersection.
3. How close parking was allowed to the intersection.
4. Capacity calculations where applicable.

CITY TRAFFIC CODES:

The purpose of city traffic codes is to facilitate the safe and orderly flow of traffic without imposing unnecessary or unreasonable restrictions.

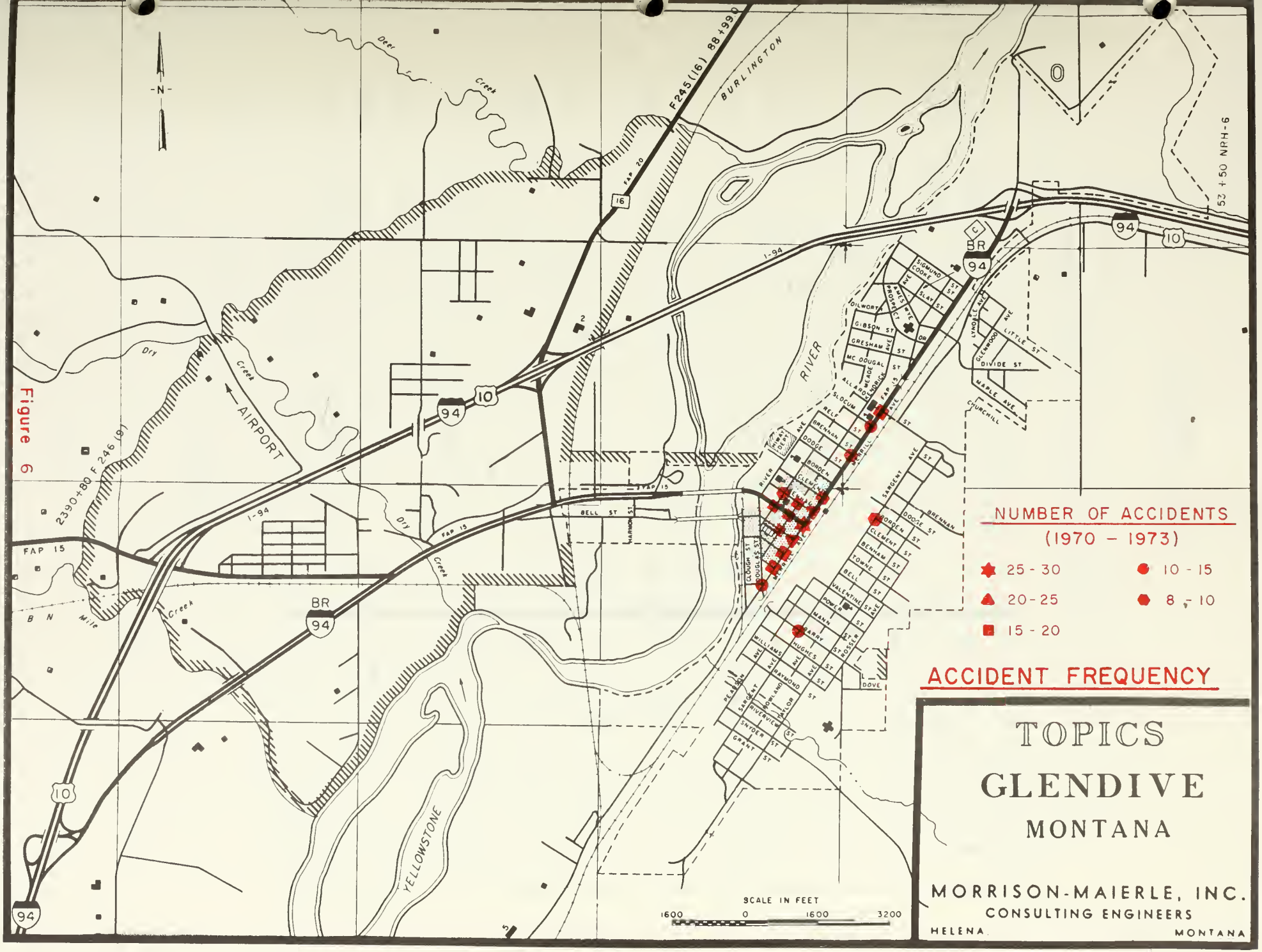

NUMBER OF ACCIDENTS
(1970 - 1973)
25 - 30
20 - 25
15 - 20
10 - 15
8 - 10
ACCIDENT FREQUENCY
TOPICS
GLENDIVE
MONTANA
MORRISON-MAIERLE, INC.
CONSULTING ENGINEERS
HELENA MONTANA
SCALE IN FEET
1600 0 1600 3200
RIVER
YELLOWSTONE
AIRPORT
BURLINGTON
I-94
FAP 15
FAP 16
FAP 20
BR 94
BELL ST
Dry Creek
Deer Creek
B N Mile
52 + 50 NPH-6
2390+80 F 246(9)
F245(16) 88+990

Figure 6

ACCIDENT RATES

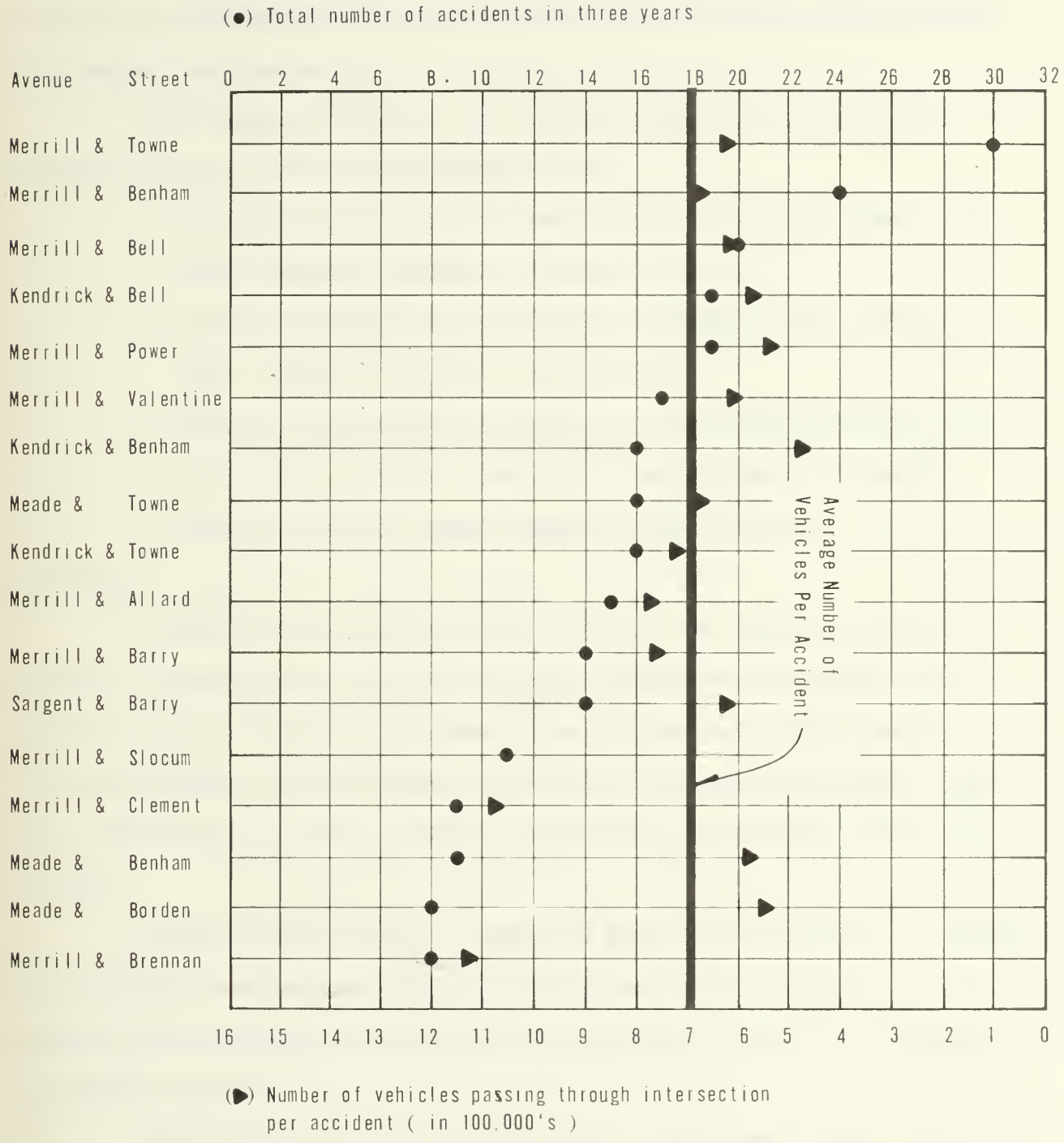

(●) Total number of accidents in three years
Avenue Street
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32
Merrill & Towne
Merrill & Benham
Merrill & Bell
Kendrick & Bell
Merrill & Power
Merrill & Valentine
Kendrick & Benham
Meade & Towne
Kendrick & Towne
Merrill & Allard
Merrill & Barry
Sargent & Barry
Merrill & Slocum
Merrill & Clement
Meade & Benham
Meade & Borden
Merrill & Brennan
Average Number of Vehicles Per Accident
16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
(▶) Number of vehicles passing through intersection per accident (in 100,000's)

TABLE 3

The city codes of Glendive are well set up to do this and in most cases are in agreement with the "1968 Uniform Vehicle Code and Model Traffic Ordinances", and Montana law.

The following sections of the Glendive codes could be revised or added to conform to the Uniform Vehicle Code.

1. Section 17-137(a) of the Glendive code revised to conform to the UVC. Section 11-204(a)1. Flashing Signals.
2. Section 11-204(b) of the UVC should be added to the Glendive code. Flashing signals at R/R crossings.
3. Section 17-243 should be revised to conform with Sections 10-102 and 10-104 of the UVC. Accidents involving death or personal injury and duty to give information and render aid.

PARKING:

A general parking inventory was not within the scope of this study. However, recommendations for certain parking restrictions were made when it affected safety or capacity and where it was related to a TOPICS project. Restricted parking zones are shown on several of the project plan maps to comply with Montana Law and to provide a safer and more efficient traffic facility.

On-street angle parking is common in many areas of Glendive. Although angle parking provides more spaces per block than parallel parking, it is a practice which creates an unsafe condition and tends to restrict the orderly movement of traffic.

On any Federal Aid road system, federal regulations require that angle parking be eliminated before federal funds can be expended on an improvement project.

It is recommended that a program be initiated by the City of Glendive which will convert on-street angle parking to parallel parking. Off-street parking may have to be provided to supply the needed additional parking spaces.

TRAFFIC ENGINEERING AND MAINTENANCE CAPABILITIES:

The City of Glendive maintains its street and road network, as well as its traffic control devices, with City maintenance forces. This practice has been successful in the past and should continue to be in the foreseeable future.

Engineering consultants have been engaged by the City for specific projects which were beyond the capabilities of City forces.

Primary and Interstate routes within the urban area are maintained by Montana Department of Highway forces.

IV

TOPICS IMPROVEMENT PROJECTS

MERRILL AVENUE AND BARRY STREET:

Problem

The Barry Street underpass is the only grade separation crossing of the railroad in Glendive. During spring runoff and heavy rains, water collects in the underpass faster than the drainage system can dispose of it.

The intersection of Merrill Avenue and Barry Street has had a large number of accidents primarily due to vehicles coming out of the Barry Street underpass and going across Merrill onto Douglas. These vehicles are crossing southbound traffic on Merrill which has the right-of-way.

The south access from the grocery store parking lot is another high accident area. It is near the intersection of Barry and Merrill. Vehicles entering the street at this point do not have sufficient site distance to see vehicles coming off Barry and on to Merrill.

Recommended Improvements

The drainage system in the Barry Street underpass should be improved. Since this project is presently being designed by State forces, no diagram is shown in this report. The MDH is presently studying this problem.

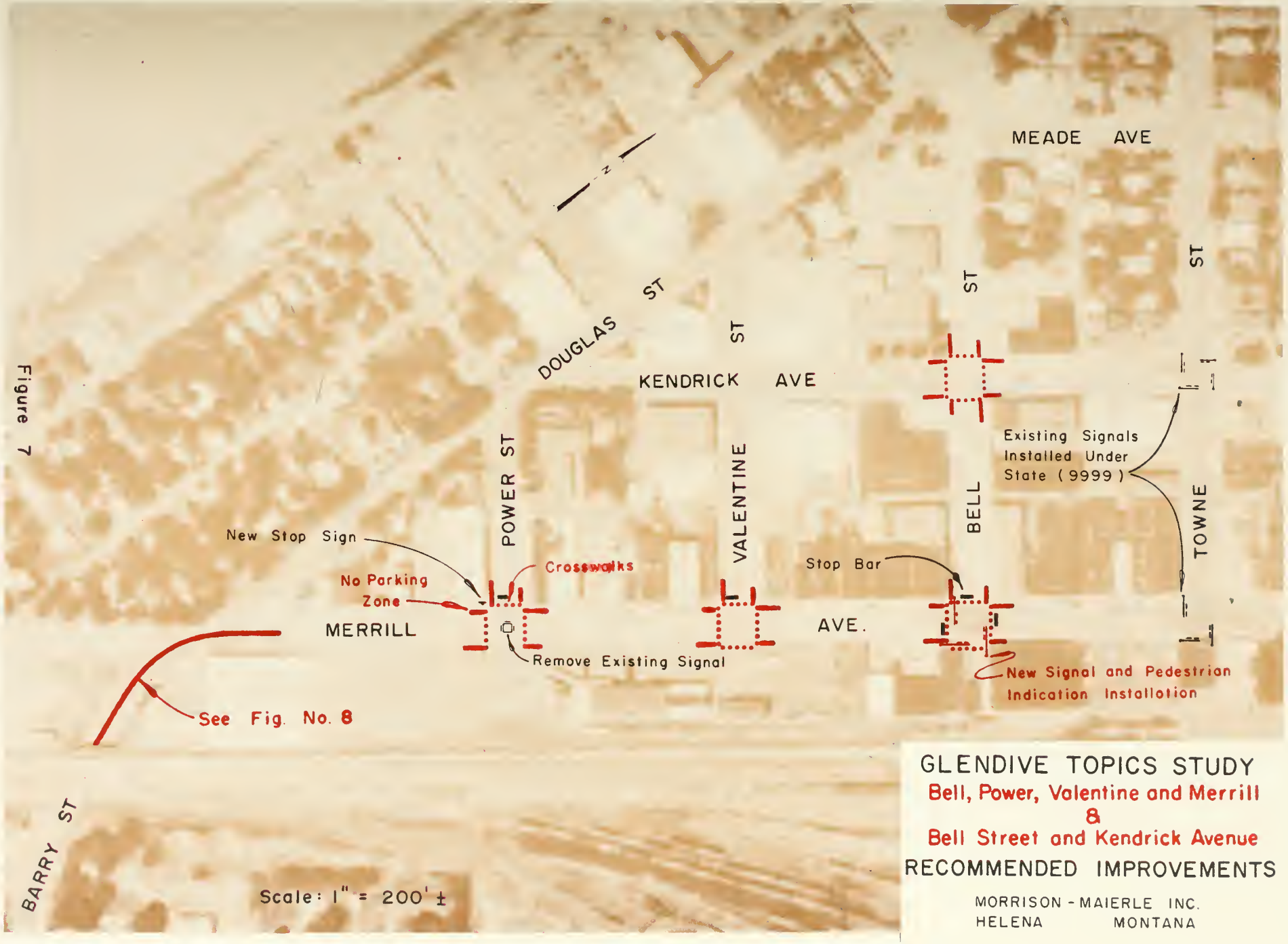
The intersection should be striped as shown in Figures 7 and 8 and the access from the parking lot should be closed as shown.

Expected Results

The results will be year around use of the Barry Street underpass and increased capacity and safety.

Estimated Cost: $33,000

Priority: 1



GLENDIVE TOPICS STUDY

Bell, Power, Valentine and Merrill & Bell Street and Kendrick Avenue

RECOMMENDED IMPROVEMENTS

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HELENA MONTANA

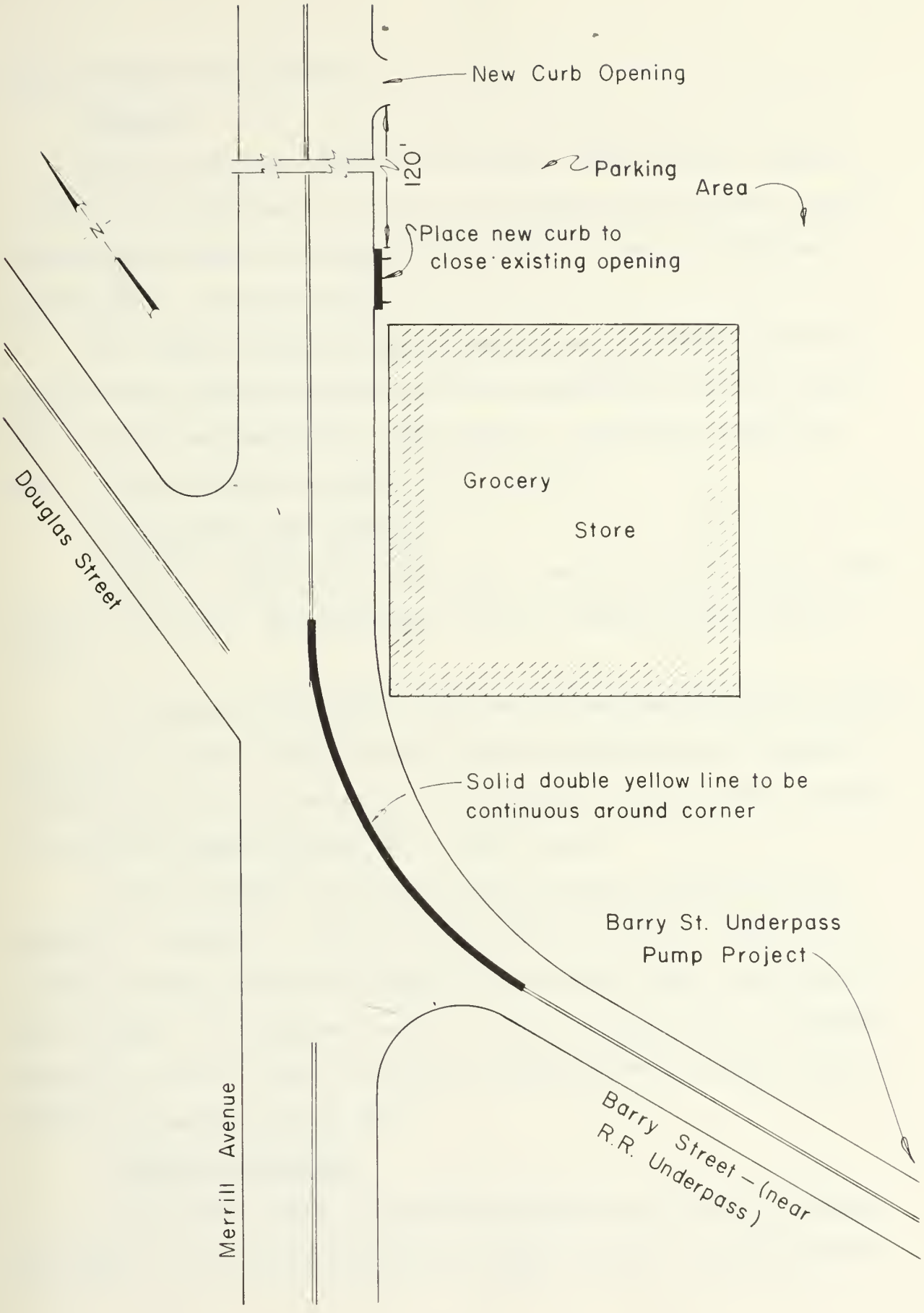

New Curb Opening
120'
Parking
Area
Place new curb to
close existing opening
Grocery
Store
Douglas Street
Solid double yellow line to be
continuous around corner
Barry St. Underpass
Pump Project
Merrill Avenue
Barry Street – (near
R.R. Underpass)

Figure 8

MERRILL AVENUE AND BELL STREET:

Problem

Merrill Avenue is a Federal Aid Primary I Street and Bell Avenue is a major Federal Aid Primary II street in the TOPICS classification. Merrill Avenue at Bell Street is functionally classified as a minor arterial and Bell Street is a collector street.

The signal at this intersection does not meet the Manual on Uniform Traffic Control Devices standards, and is not coordinated with the light at Merrill Avenue and Towne Street. This results in unnecessary traffic delay. Parking is allowed too close to the crosswalk.

Traffic, Safety and Capacity

On Merrill Avenue just north of Bell, the ADT is 9,250 and just south of Bell it is 8,500. Bell Street has an ADT of 3,500 just west of Merrill Avenue.

The minimum volume warrant is met for the required 8 hours for an average day and is only 5 vehicles short of meeting warrants for the ninth hour. The peak hour for this intersection is 850 approach vehicles which is enough to satisfy the System's Warrant for a traffic signal.

Merrill and Bell has the third highest accident record of any intersection in Glendive. It has had 20 accidents in the last 3 years. Six of these accidents were rear end types, 5 were turning, and 5 were backing type accidents. The peak hour traffic for this intersection has 423 vehicles approaching from the north, 364 vehicles approaching from the south, and 116 vehicles approaching from the west.

Suggested Improvements

A new signal should be installed with two signal faces per approach. The timing is to be coordinated with the signal at Merrill Avenue and Towne

Street. Pedestrian indicators should be installed. Parking should not be allowed within 30 feet of the crosswalks on the approach side and 20 ft. on the departure side. (See Figure 7.)

Expected Results

Coordinating the signals will give a better movement of traffic on Merrill Avenue. Two signal faces per approach will give better signal visibility. The pedestrian lights will insure safe pedestrian crossing. The removal of parking near the crosswalks will allow for better sight distance and more room to make turning movements.

Estimated Cost: $16,700

Priority: 2

MERRILL AVENUE AND POWER STREET:

Problem

The existing traffic signal does not meet M.U.T.C.D. standards. There is only one signal face per approach. Parking is allowed too close to the crosswalks.

Traffic, Safety and Capacity

On Merrill Avenue at Power, the ADT is just over 5,000 vehicles. At the peak hour, there are 339 vehicles approaching the intersection from the north. There are 264 vehicles approaching from the south. On Power Street at the peak hour there are 34 vehicles approaching the intersection from the west. These figures show that there is not even sufficient volume at the peak hour to warrant a traffic signal.

Suggested Improvements

The existing traffic signal should be removed. A stop sign should be installed and a stop bar painted to stop traffic on Power Street approaching Merrill Avenue. Parking will be restricted so that no part of any ve-

hicle will be within 30 feet of any crosswalk on the Power Street approach and 20 feet on all other approach and departure lanes. (See Figure 7.)

Expected Results

Removing the traffic signal will increase the capacity of Merrill Avenue and decrease the total delay time for all vehicles to go through the intersection. The removal of the parking will open up the intersection for better sight distance and give more room for making turning movements.

Estimated Cost: $800

Priority: 3

KENDRICK AVENUE BETWEEN ALLARD AND GRESHAM STREETS:

Problem

Kendrick Avenue between Allard and Gresham Streets serves much of the traffic that goes to the high school. It is narrow in places and has cars parked on both sides. Students and faculty alike park along this street and walk to the school buildings. There are no curbs or sidewalks, resulting in many people walking in the street. This is a safety hazard as well as reducing the capacity of this section. Also, many students who live in the residential area north of the High School walk along this street to school. There is no designated pedestrian lane and city officials and concerned citizens feel that this conflict between pedestrians and vehicular traffic constitutes a serious safety hazard which will inevitably result in eventual injury.

This street also has problems during football games. The football field is just east of this section of street. Cars are parked all along both sides of Kendrick and then the passengers walk in the street to the football stands. This is also a safety problem.

The width of the pavement through this section is 24 feet. Vehicles are not parked on the paved surface, but do park right at the edge of it on the west side.

A ticket booth (and Press Box) is located as shown in the map at the edge of the paved way.

Traffic

The streets around the high school carry the following traffic loadings on an average school day:

On Kendrick just north of Relf	1649 ADT
On Kendrick just south of Gresham	1293 ADT
On Allard just west of Kendrick	507 ADT
On Slocum just west of Kendrick	521 ADT
On Slocum just east of Kendrick	1623 ADT

These volumes show that a major portion of the traffic uses Kendrick Avenue between Allard and Gresham for access to the school.

Suggested Improvements

This section of Kendrick will be widened as shown in Figures 9 and 10. Curbs are to be installed on both sides and sidewalks on the east side. The curbs will keep the cars from parking off the street. The sidewalk will give the pedestrians a safe place to walk while keeping them off of the road. For a straight alignment and good sight distance, the ticket booth will have to be moved back from the right-of-way.

Expected Results

These improvements will greatly increase the safety of this section. Pedestrians will no longer be using the street and impeding traffic flow.

Estimated Cost: $27,000

Priority: 4

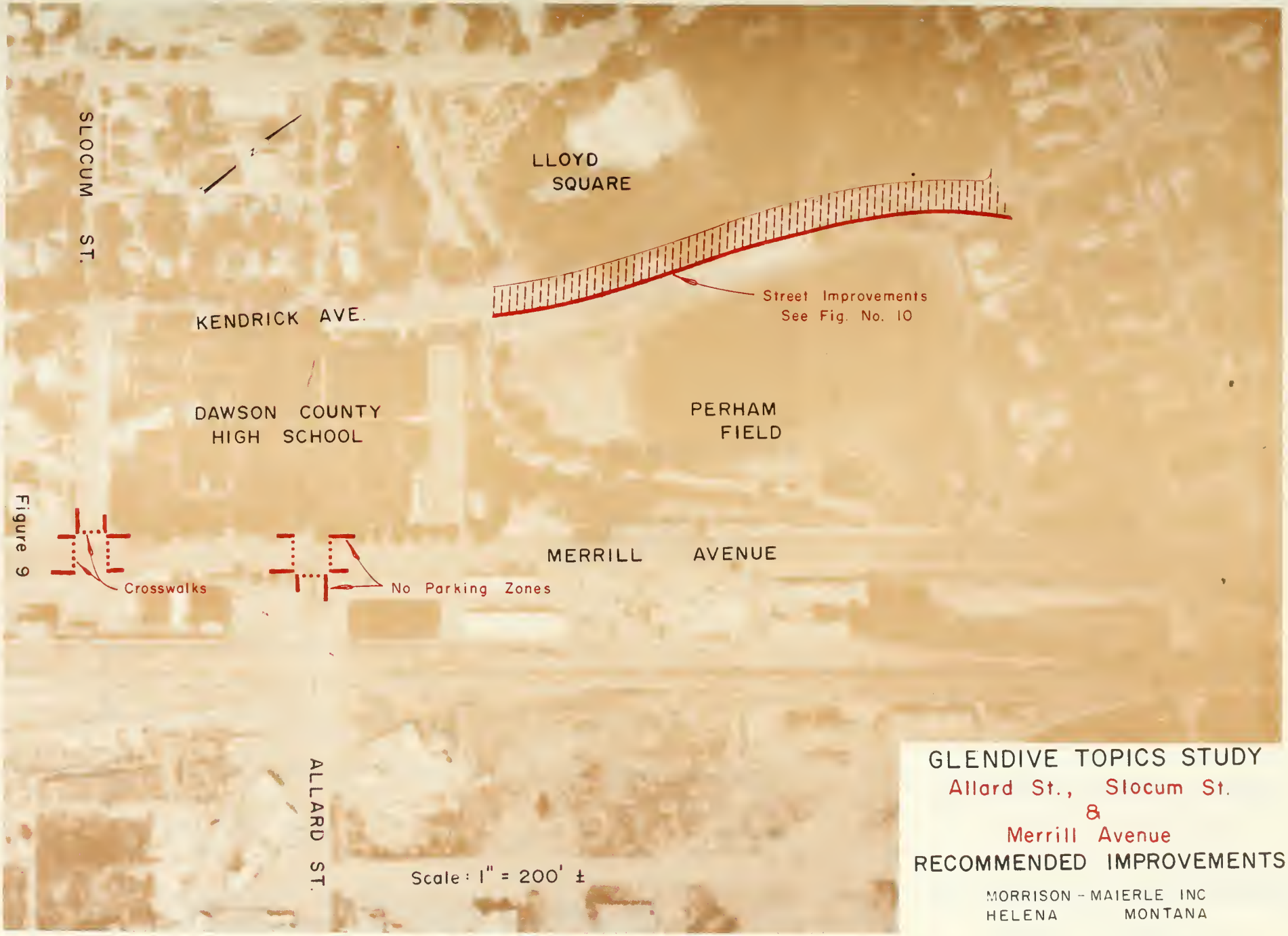


Figure 9

GLENDIVE TOPICS STUDY

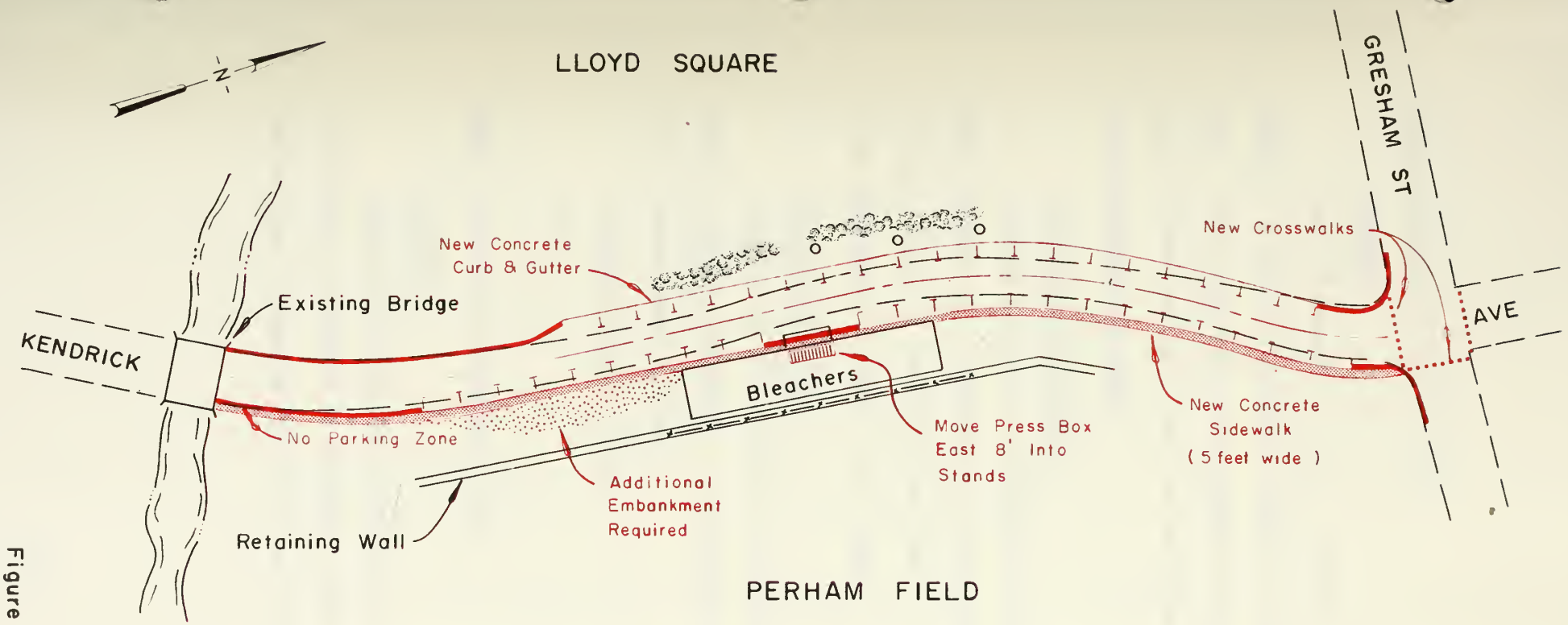
Allard St., Slocum St.

&

Merrill Avenue

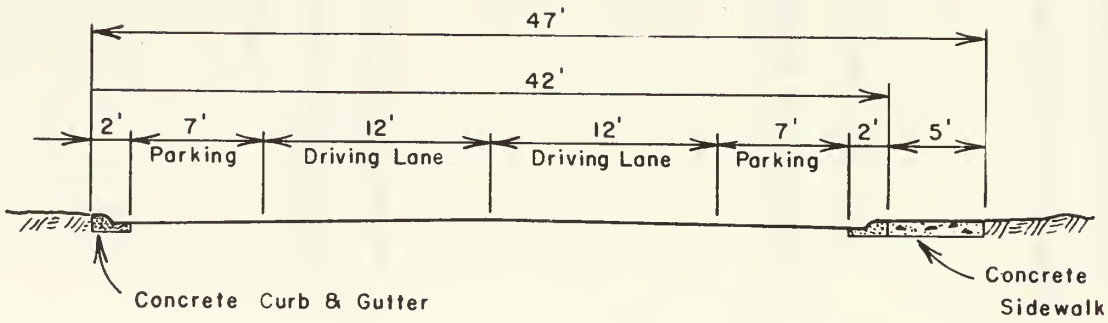
RECOMMENDED IMPROVEMENTS

MORRISON - MAIERLE INC
HELENA MONTANA



PLAN

Scale: 1" = 100'



TYPICAL IMPROVEMENT SECTION

Figure 10

GLENDIVE TOPICS STUDY

STREET WIDENING

KENDRICK AVENUE

RECOMMENDED IMPROVEMENTS

MORRISON - MAIERLE INC
HELENA MONTANA

MERRILL AVENUE AND BENHAM STREET:

Problem

Merrill Avenue is a major arterial in the Glendive Street System. Benham is a major circulation element in the Glendive Central Business District. There have been 24 accidents at this location in the last 3 years. Seven of these accidents are rear end type, five are backing, and 8 are turning movement accidents.

Suggested Improvements

Parking should be eliminated so that no part of a parked car is within 50 feet of a crosswalk at a controlled approach lane and 20 feet on all other approach and departure lanes. A right turn lane should be marked on the pavement and signed. See Figure 11.

Expected Results

Restriction of parking will open the intersection for sight distance and turning movements. The turning lane will increase the capacity of the Benham Street approach.

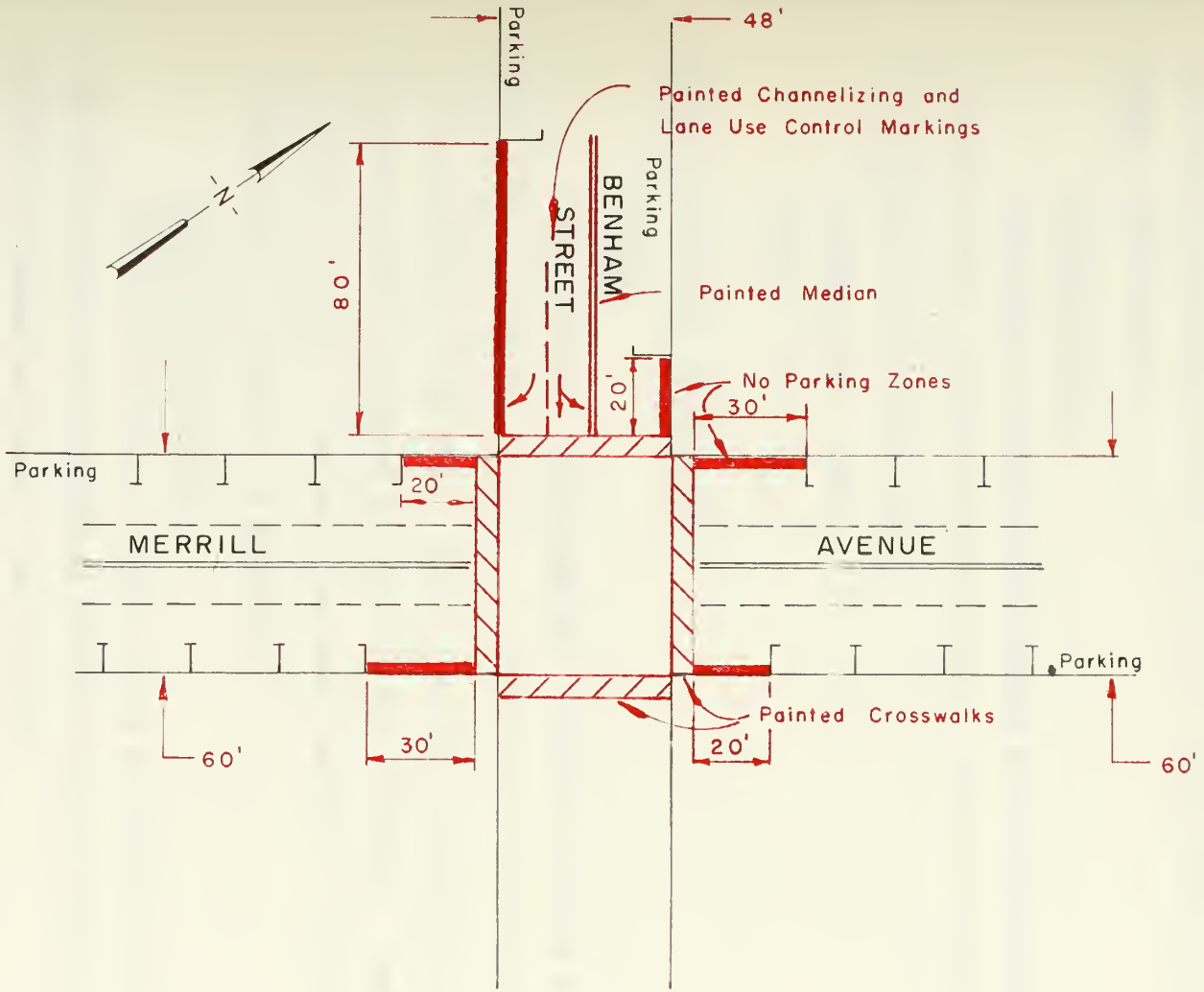
Estimated Costs: $200

Priority: 5

MERRILL AVENUE AND VALENTINE STREET:

Problem

Valentine Street is a circulatory element in the CBD of Glendive. It has had 17 accidents in the last 3 years. Six of these accidents were turning type, 5 were backing type, and 4 were rear end type.



Scale : 1" = 50'

Figure 11

GLENDIVE TOPICS STUDY

Benham St and Merrill Ave

RECOMMENDED IMPROVEMENTS

MORRISON - MAIERLE INC
HELENA MONTANA

Suggested Improvements

Paint a stop bar on the Valentine Street approach to Merrill Avenue at the intersection. Remove curb parking from both Merrill Avenue and Valentine Street so that no part of a parked car is within 30 feet of a crosswalk on a controlled approach and 20 feet on all other approach and departure lanes. (See Figure 7)

Expected Results

The removal of parking will increase sight distance and allow more room for drivers to make turning movements. This will decrease the number of accidents at this intersection.

Estimated Cost: $100

Priority: 6

MERRILL AVENUE AND ALLARD STREET:

Problem

Allard Street is the second most important crossing over the railroad tracks in Glendive. It gives access from the northern end of Glendive to the east part of the city. There is a school crossing at this intersection and parking is allowed too close to this crosswalk. There have been 5 turning accidents, 3 rear end type, and 2 backing. The total for the intersection in 3 years is 15 accidents.

Suggested Improvements

Curb parking should be restricted to no parking within 30 feet of the intersection on the controlled approach lane and 20 feet on all other approach and departure lanes. (See Figure 9)

Expected Results

The removal of parking will increase sight distance in the intersection, which will increase the safety and decrease the number of accidents.

Estimated Cost: $100

Priority: 7

MERRILL AVENUE AND SLOCUM STREET:

Problem

Slocum Street provides a major access route to the high school. There have been 11 accidents here in the last 3 years. Five are turning and 4 are sideswipe accidents. This indicates insufficient room in the intersection. This is especially true of the Slocum approach.

Suggested Improvments

Parking is to be restricted to no parking within 30 feet of the intersection on the controlled approach lane and 20 feet on all other approach and departure lanes. A stop bar and crosswalk will be placed on the Slocum Street approach. (See Figure 9)

Expected Results

The elimination of parking will increase sight distance and the room available for turning movements. The stop bar and crosswalk will increase pedestrian safety in crossing Slocum.

Estimated Cost: $100

Priority: 8

KENDRICK AVENUE AND BELL STREET:

Problem

Kendrick Avenue and Bell Street are major circulation elements in the CBD of Glendive. There have been 19 total accidents in this area within

the past 3 years. Of these, 8 have been backing type, 3 turning, and 3 sideswipe type accidents. Parking is allowed too close to the corners, limiting sight distance and the area in which turning movements may be made.

Suggested Improvements

On both streets, parking should be eliminated on the southwest corner, and parking should be eliminated from the crosswalk for 30 feet on controlled approach lanes and 20 feet on all other approach and departure lanes. Stop bars and crosswalk should be painted on the street. (See Figure 7)

Expected Results

The elimination of the parking spaces close to the intersection will increase safety by increasing sight distance and allowing more room for vehicles to complete their turning movements. It will also allow the cars that are parked to see the cars that are coming around the blind corner.

Estimated Cost: $100

Priority: 9

TYPE II SIGNING UPDATE:

Problem

Many of the signs on Type II system are mutilated or do not conform to the "1971 Manual on Uniform Traffic Control Devices."

Recommended Improvements

The signs that need replacing are listed in Table 4.

Expected Results

The results will be increased safety through conformity with the signing prescribed in the 1971 Manual.

Estimated Cost: $4,500

Priority: 10

TRAFFIC SIGNS - UPDATE		
Location	Problem	Improvements
At Kendrick on Benham Clement Borden Slocum	Old Stop Sign	Replace 8 stop signs
On Kendrick at Gresham	Out of Date Yield Signs	Replace 2 Yield signs
At Delworth on Prospect	Old Stop signs	Replace 2 Stop signs
On Wye at Ames	Old Stop sign, out of date Yield sign	Replace Stop sign and Yield sign
On Griswold at the Railroad Tracks	Old Stop signs	Replace 2 Stop signs
On Merrill at Griswold	Old School Advance sign	Replace School Advance sign
On Anderson at Griswold	Out of date Yield sign	Replace Yield sign
On Allard at Meade	Out of date Yield sign	Replace Yield sign
Sargent at Clement Towne	Old Stop signs	Replace 2 Stop signs
On Sargent at Valentine Power Main	Out of date Yield signs	Replace 6 yield signs
On Taylor at Barry	Old Stop signs	Replace 2 stop signs
On Barry each side of Taylor and each side of Nowlen	Out of date School Crossing signs	Replace 4 School Crossing signs
On Sargent at Barry	Old Stop signs	Replace 2 Stop signs
On Anderson at Barry	Old Stop signs	Replace 2 Stop signs
On Taylor at Hughes Williams Raymond Ayers Riverview Snyder Grant	Out of date Yield signs	Replace 9 Yield signs

TABLE 4

TRAFFIC SIGNS - UPDATE (Continued)		
Location	Problem	Improvements
On Sargent at Slocum Brennan Dodge	 Out of date Yield sign Out of date Yield sign Out of date Yield & Stop sign	 Replace 1 Yield sign Replace 1 Yield sign Replace 1 Yield sign Replace 1 Stop sign
On Douglas at Merrill	Out of date Yield sign	Replace Yield sign
On Kendrick at Douglas	Out of date Yield sign	Replace Yield sign
On Power at Douglas	Old Stop sign	Replace Stop sign
On Douglas at Bell	Ols Stop signs	Replace 2 Stop signs
On Valentine at Kendrick	Old Stop signs	Replace 2 Stop signs
At Meade on Benham Clement Borden Dodge Brennan Relf Slocum Allard McDougal Gresham Gibson Dilworth	Old Yield signs	Replace 20 Yield signs
On Meade between Towne and Benham Clement and Borden	 Old School Crossing sign Old School Advance & Crossing sign	 Replace School Crossing sign Replace School Advance and Crossing sign
Borden and Dodge	Old School Advance & Crossing sign	Replace School Advance and Crossing sign.

TABLE 4 (Continued)

V

SURVEILLANCE AND EVALUATION

RECOMMENDED PROCEDURES:

Standard surveillance practices already in use by the Montana Department of Highways and the City of Glendive will provide the data needed for evaluation and will serve to indicate the effectiveness of TOPICS improvements which are put into operation. The evaluation form reproduced in the appendix would provide a method of recording and evaluating the effectiveness of each TOPICS improvement.

The MDH regular traffic count program should be revised to include needed additional counts at TOPICS improvement locations on the Type II system which are not now in the program.

The Glendive Police Department should continue to keep accident records at all improvement locations as they presently do throughout the City.

These measures will provide the means for evaluating the overall effectiveness of the TOPICS program and will provide the data required for the annual TOPICS report to Congress.

VI

APPENDIX

The regular meeting of the Glendive City Council was held on Monday evening, January 7, 1974, at 7:30 P.M. in the council Room of the City Hall. Present, Mayor L. C. Allen, Atty Cook, City Clerk E. B. Hertz, Aldermen: Lloyd, Twedt, Steffen, Dufner Olson, Jimison, Trangmoe and Wrigg;

Meeting was called to order by Mayor Allen and the minutes of the previous meeting were read and approved as read.

OLD BUSINESS:

X EMPLOYEES REPAYMENT OF WAGES: Atty Cook stated he had received $25.00 from Ed Schmitz and also is making arrangements for Mr. Seigle and Joe Dinardi for repayment.

DOG ORDINANCE: Ordinance No 792 was read and approved as read in a motion by Alderman Olson and seconded by Alderman Wrigg and those in favor, Wrigg, Twedt, Steffen, Olson, Trangmoe and against Dufner, Jimison and Lloyd. Majority carried.

CORRESPONDENCE:

1. District Sanitarian sent report on waste water dischare from the City Lagoon for Oct thru December 1973, stating during this period no waste water was discharged, Signed John C. Gech.

2. Economic Development Association: requesting we sign an Interlocal Resolution to support the Provisional Area Council request approved.

3. Topics by Morrison-Maierle Inc.: Request to approve the enclosed report by Morrison-Maierle Inc. by doing so we would be considered for the subway pumps etc. After discussion request approved in the motion by Dufner and seconded by Wrigg and unanimously carried.

NEW BUSINESS:

Flood report was given to each council member and request to pass Resolution No. 934 whereas, the City of Glendive has adopted and is enforcing National Building Code 1967, Zoning Ordinance #613 as amended. By passing this resolution it will give the people in flooding area a better chance to obtain flood insurance. Resolution No. 934 was approved in a motion by Dufner and seconded by Jimlison and those in favor Wrigg Twedt, Steffen, Dufner, Trangmoe, Jimison, Lloyd and thos against Olson.

MUNICIPAL OWNED UTILITIES: report from Montana League of Cities. A copy of this was made for each council member. This is the first time the City of Glendive has had to pay Consumer Councsel Tax the the gross operating revenue of the water. The amount for thequarter was $33.56.

Bruce Russell Highway Dept stated that TOPICS would replace the present underpass pump for a larger one and that each council member had to sign the agreement as stated, and agree to accept type 2 systems as shown on the map. (attached agreement) After discussion Alderman Lloyd made a motion that we accept TOPICS regulations by signing the agreement. Seconded by Dufner and unanimously carried.

The above is a true and accurate copy of the minutes of the May 15, 1972 minutes.

Elizabeth B Neff

City Clerk

MONTANA HIGHWAY COMMISSION

TRAFFIC DEPARTMENT

ACCIDENT ANALYSIS

COLLISION DIAGRAM

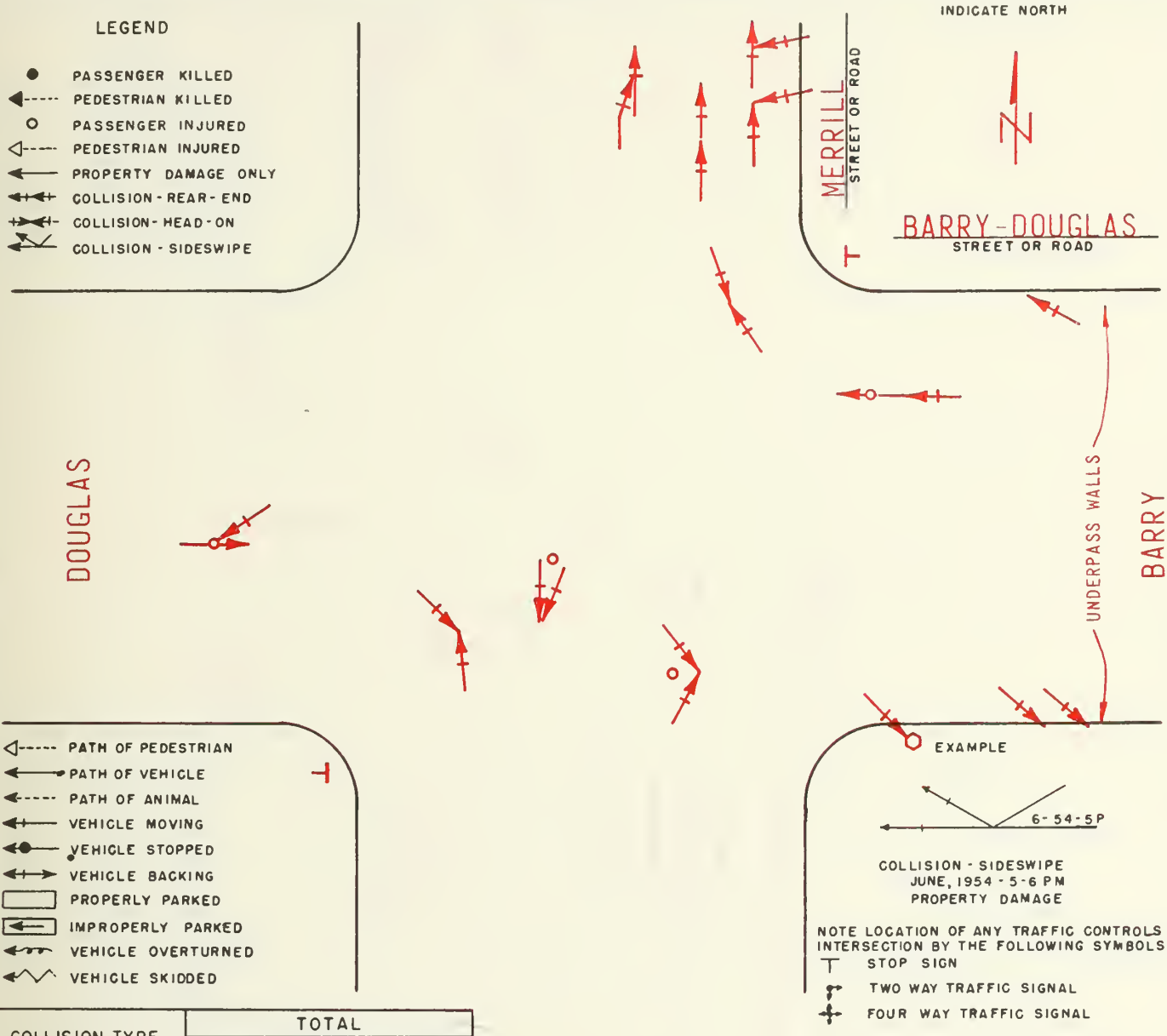
CITY OF Glendive COUNTY Dawson

INTERSECTION OF _____ AND _____

HIGHWAY NUMBER _____ _____

PERIOD COVERED 6-70 6-73

COMPILED BY _____ DRAWN BY _____ DATE _____



COLLISION TYPE	TOTAL			
	FATAL	INJURY	PROP DAMAGE	TOTAL
ANGLE			2	2
HEAD - ON			1	1
REAR - END			2	2
SIDESWIPE			1	1
TURNING MOVEMENT		2	2	4
PARKING				
NON-COLLISION				
FIXED OBJECT			4	4
PEDESTRIAN				
BACKING				
MISC.				
TOTAL		2	12	14

REMARKS _____

MONTANA HIGHWAY COMMISSION

TRAFFIC DEPARTMENT

ACCIDENT ANALYSIS

COLLISION DIAGRAM

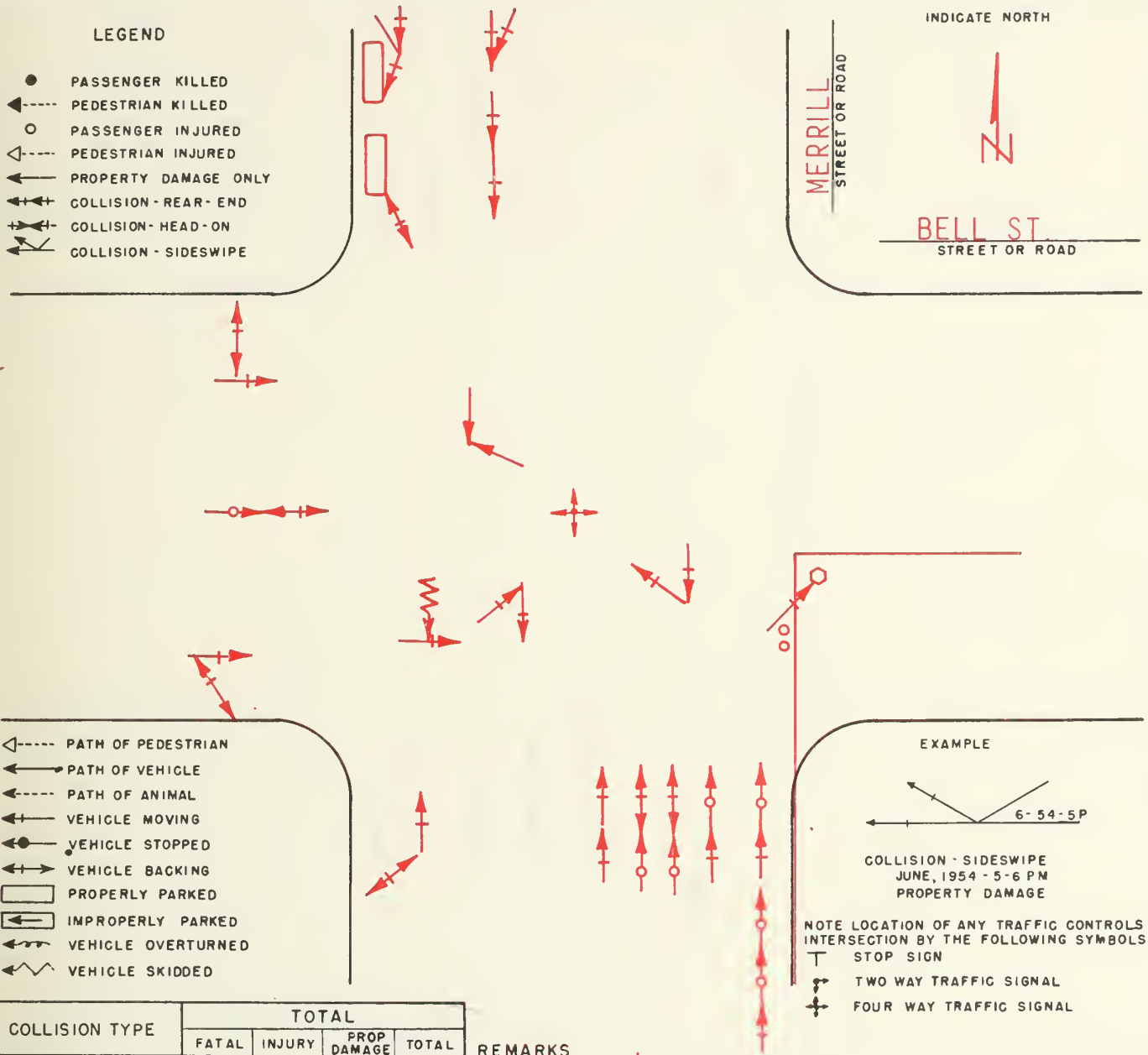
CITY OF Glendive COUNTY Dawson

INTERSECTION OF _____ AND _____

HIGHWAY NUMBER _____ _____

PERIOD COVERED 6-70 6-73

COMPILED BY _____ DRAWN BY _____ DATE _____



COLLISION TYPE	TOTAL			
	FATAL	INJURY	PROP DAMAGE	TOTAL
ANGLE			1	1
HEAD - ON				
REAR - END			5	5
SIDESWIPE			1	1
TURNING MOVEMENT			4	4
PARKING				
NON - COLLISION				
FIXED OBJECT		1		1
PEDESTRIAN				
BACKING			7	7
MISC.				
TOTAL		1	18	19

REMARKS _____

MONTANA HIGHWAY COMMISSION

TRAFFIC DEPARTMENT

ACCIDENT ANALYSIS

COLLISION DIAGRAM

CITY OF Glendive COUNTY Dawson

INTERSECTION OF _____ AND _____

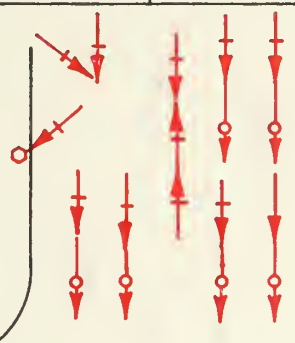
HIGHWAY NUMBER _____ _____

PERIOD COVERED 6-70 6-73

COMPILED BY _____ DRAWN BY _____ DATE _____

LEGEND

- PASSENGER KILLED
- PEDESTRIAN KILLED
- PASSENGER INJURED
- PEDESTRIAN INJURED
- PROPERTY DAMAGE ONLY
- COLLISION - REAR - END
- COLLISION - HEAD - ON
- COLLISION - SIDESWIPE

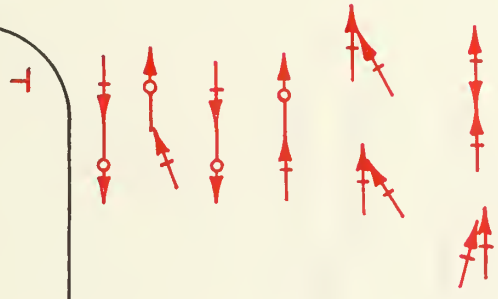


MERRILL
STREET OR ROAD

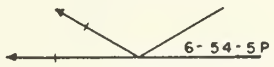
INDICATE NORTH

POWER
STREET OR ROAD

- PATH OF PEDESTRIAN
- PATH OF VEHICLE
- PATH OF ANIMAL
- VEHICLE MOVING
- VEHICLE STOPPED
- VEHICLE BACKING
- PROPERLY PARKED
- IMPROPERLY PARKED
- VEHICLE OVERTURNED
- VEHICLE SKIDDED



EXAMPLE



COLLISION - SIDESWIPE
JUNE, 1954 - 5-6 PM
PROPERTY DAMAGE

NOTE LOCATION OF ANY TRAFFIC CONTROLS AT INTERSECTION BY THE FOLLOWING SYMBOLS

- STOP SIGN
- TWO WAY TRAFFIC SIGNAL
- FOUR WAY TRAFFIC SIGNAL

COLLISION TYPE	TOTAL			
	FATAL	INJURY	PROP DAMAGE	TOTAL
ANGLE				
HEAD - ON			1	1
REAR - END			9	9
SIDESWIPE			5	5
TURNING MOVEMENT		1	1	2
PARKING				
NON - COLLISION				
FIXED OBJECT			1	1
PEDESTRIAN				1
BACKING			1	
MISC.				
TOTAL		1	18	19

REMARKS _____

MONTANA HIGHWAY COMMISSION

TRAFFIC DEPARTMENT

ACCIDENT ANALYSIS

COLLISION DIAGRAM

CITY OF Glendive COUNTY Dawson

INTERSECTION OF _____ AND _____

HIGHWAY NUMBER _____ _____

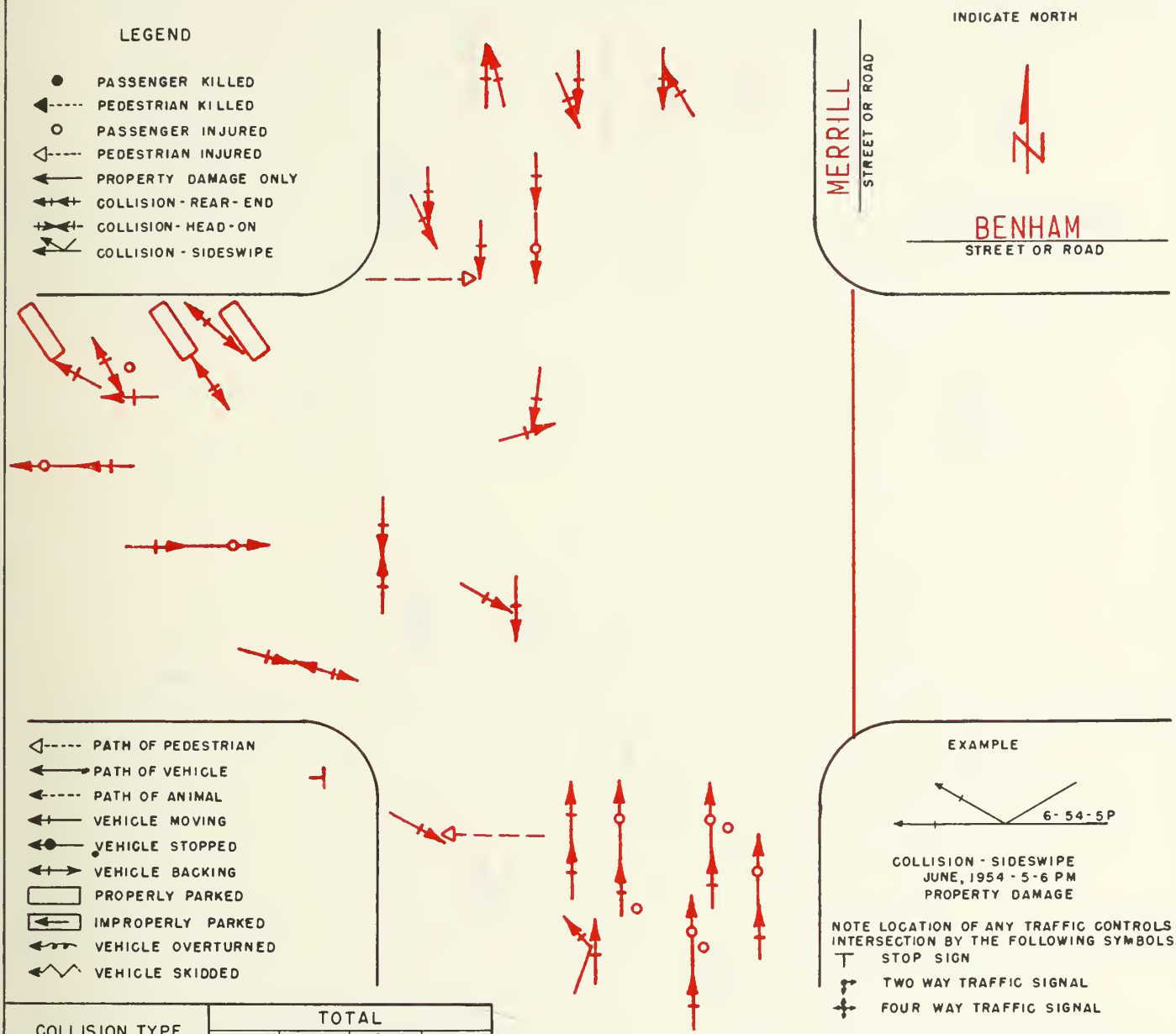
PERIOD COVERED 6-70 6-73

COMPILED BY _____ DRAWN BY _____ DATE _____

LEGEND

- PASSENGER KILLED
- PEDESTRIAN KILLED
- PASSENGER INJURED
- PEDESTRIAN INJURED
- PROPERTY DAMAGE ONLY
- COLLISION - REAR - END
- COLLISION - HEAD - ON
- COLLISION - SIDESWIPE

INDICATE NORTH



- PATH OF PEDESTRIAN
- PATH OF VEHICLE
- PATH OF ANIMAL
- VEHICLE MOVING
- VEHICLE STOPPED
- VEHICLE BACKING
- PROPERLY PARKED
- IMPROPERLY PARKED
- VEHICLE OVERTURNED
- VEHICLE SKIDDED

EXAMPLE

COLLISION - SIDESWIPE
JUNE, 1954 - 5-6 PM
PROPERTY DAMAGE

NOTE LOCATION OF ANY TRAFFIC CONTROLS AT INTERSECTION BY THE FOLLOWING SYMBOLS

- STOP SIGN
- TWO WAY TRAFFIC SIGNAL
- FOUR WAY TRAFFIC SIGNAL

COLLISION TYPE	TOTAL			
	FATAL	INJURY	PROP DAMAGE	TOTAL
ANGLE				
HEAD - ON			1	1
REAR - END		3	5	8
SIDESWIPE			1	1
TURNING MOVEMENT			6	6
PARKING				
NON - COLLISION				
FIXED OBJECT				
PEDESTRIAN		2		2
BACKING		1	3	4
MISC.			1	1
TOTAL		6	17	23

REMARKS _____

MONTANA HIGHWAY COMMISSION

TRAFFIC DEPARTMENT
ACCIDENT ANALYSIS

COLLISION DIAGRAM

CITY OF Glendive COUNTY Dawson

INTERSECTION OF _____ AND _____

HIGHWAY NUMBER _____ _____

PERIOD COVERED 6-70 6-73

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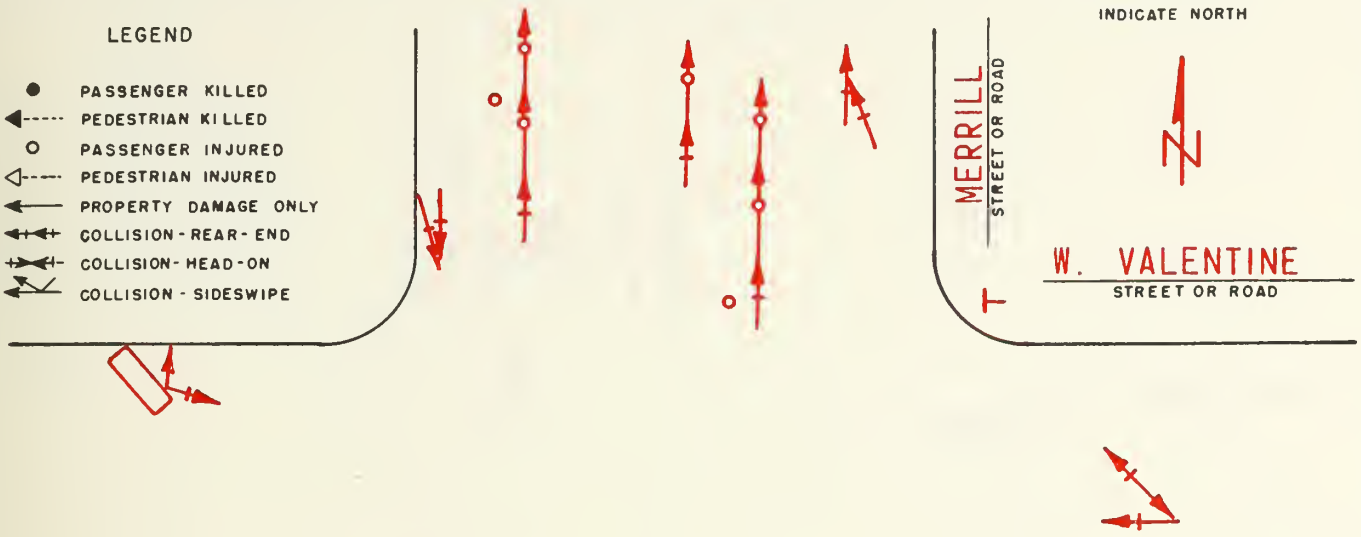
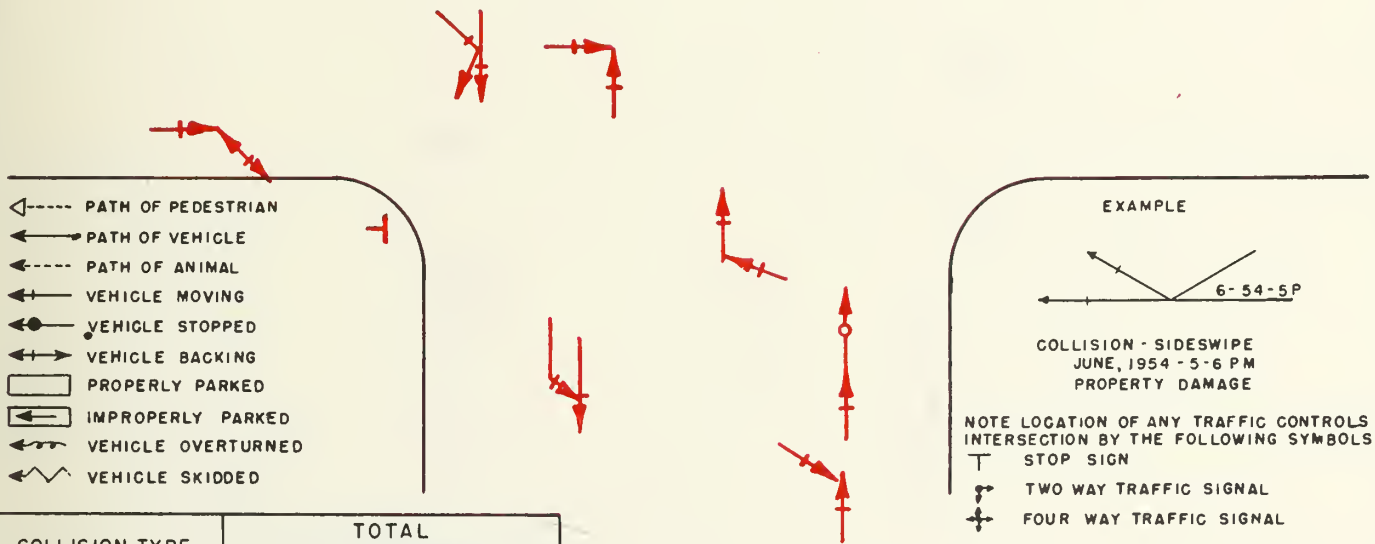




COLLISION TYPE	TOTAL			
	FATAL	INJURY	PROP DAMAGE	TOTAL
ANGLE			1	1
HEAD - ON				
REAR - END		2	2	4
SIDESWIPE			1	1
TURNING MOVEMENT			5	5
PARKING				
NON - COLLISION				
FIXED OBJECT				
PEDESTRIAN				
BACKING			3	3
MISC.				
TOTAL		2	12	14

REMARKS _____

MONTANA HIGHWAY COMMISSION

TRAFFIC DEPARTMENT

ACCIDENT ANALYSIS

COLLISION DIAGRAM

CITY OF Glendive COUNTY Dawson

INTERSECTION OF _____ AND _____

HIGHWAY NUMBER _____ _____

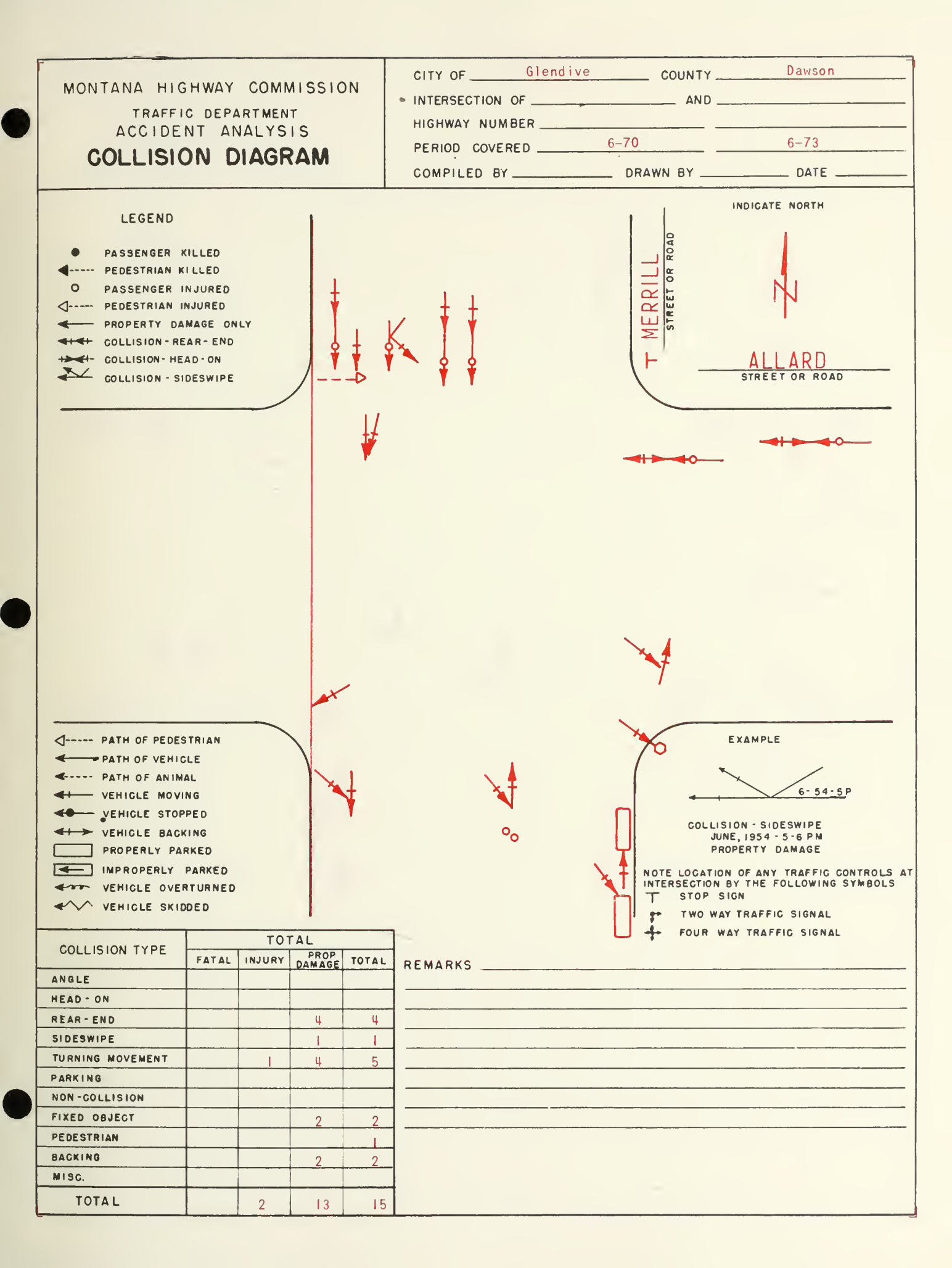
PERIOD COVERED 6-70 6-73

COMPILED BY _____ DRAWN BY _____ DATE _____

LEGEND

- PASSENGER KILLED
- PEDESTRIAN KILLED
- PASSENGER INJURED
- PEDESTRIAN INJURED
- PROPERTY DAMAGE ONLY
- COLLISION - REAR - END
- COLLISION - HEAD - ON
- COLLISION - SIDESWIPE

INDICATE NORTH



- PATH OF PEDESTRIAN
- PATH OF VEHICLE
- PATH OF ANIMAL
- VEHICLE MOVING
- VEHICLE STOPPED
- VEHICLE BACKING
- PROPERLY PARKED
- IMPROPERLY PARKED
- VEHICLE OVERTURNED
- VEHICLE SKIDDED

EXAMPLE

COLLISION - SIDESWIPE
JUNE, 1954 - 5-6 PM
PROPERTY DAMAGE

NOTE LOCATION OF ANY TRAFFIC CONTROLS AT INTERSECTION BY THE FOLLOWING SYMBOLS

- STOP SIGN
- TWO WAY TRAFFIC SIGNAL
- FOUR WAY TRAFFIC SIGNAL

COLLISION TYPE	TOTAL			
	FATAL	INJURY	PROP DAMAGE	TOTAL
ANGLE				
HEAD - ON				
REAR - END			4	4
SIDESWIPE			1	1
TURNING MOVEMENT		1	4	5
PARKING				
NON - COLLISION				
FIXED OBJECT			2	2
PEDESTRIAN				1
BACKING			2	2
MISC.				
TOTAL		2	13	15

REMARKS _____

MONTANA HIGHWAY COMMISSION

TRAFFIC DEPARTMENT
ACCIDENT ANALYSIS

COLLISION DIAGRAM

CITY OF Glendive COUNTY Dawson

INTERSECTION OF _____ AND _____

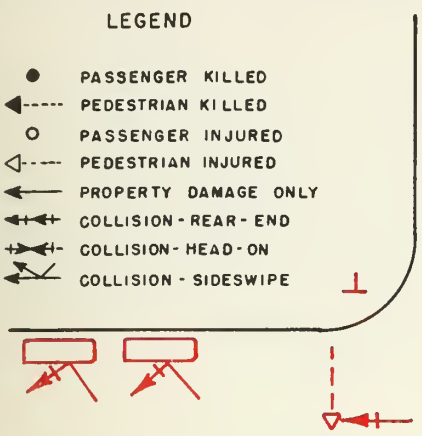
HIGHWAY NUMBER _____ _____

PERIOD COVERED 6-70 6-73

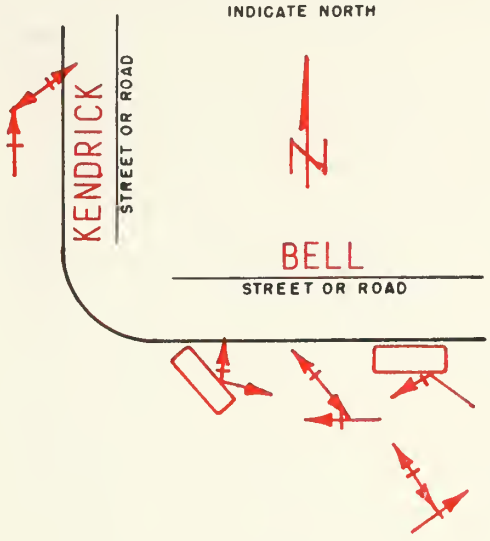
COMPILED BY _____ DRAWN BY _____ DATE _____

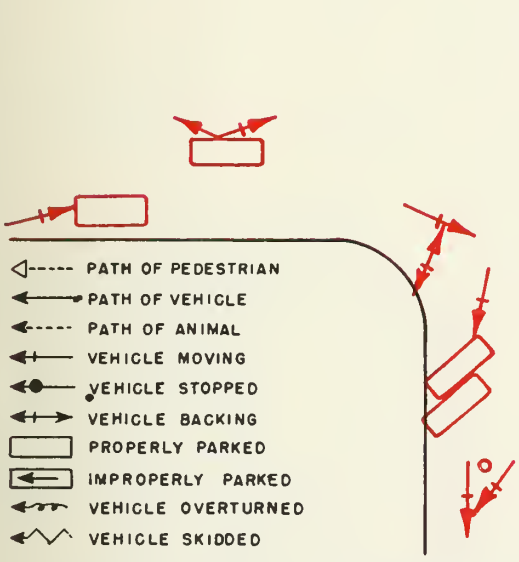
LEGEND

- PASSENGER KILLED
- PEDESTRIAN KILLED
- PASSENGER INJURED
- PEDESTRIAN INJURED
- PROPERTY DAMAGE ONLY
- COLLISION - REAR - END
- COLLISION - HEAD - ON
- COLLISION - SIDESWIPE

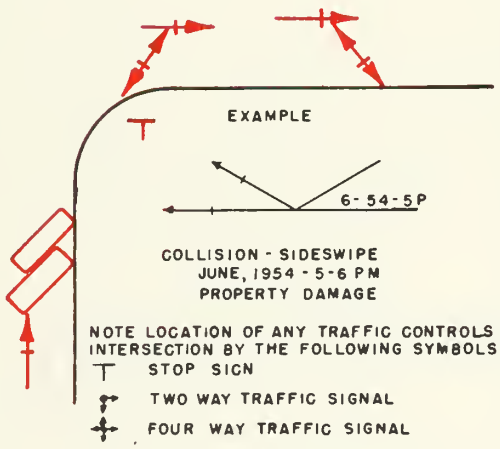


INDICATE NORTH





- PATH OF PEDESTRIAN
- PATH OF VEHICLE
- PATH OF ANIMAL
- VEHICLE MOVING
- VEHICLE STOPPED
- VEHICLE BACKING
- PROPERLY PARKED
- IMPROPERLY PARKED
- VEHICLE OVERTURNED
- VEHICLE SKIDDED



COLLISION - SIDESWIPE
JUNE, 1954 - 5-6 PM
PROPERTY DAMAGE

NOTE LOCATION OF ANY TRAFFIC CONTROLS AT INTERSECTION BY THE FOLLOWING SYMBOLS

- STOP SIGN
- TWO WAY TRAFFIC SIGNAL
- FOUR WAY TRAFFIC SIGNAL

COLLISION TYPE	TOTAL			
	FATAL	INJURY	PROP DAMAGE	TOTAL
ANGLE			2	2
HEAD - ON				
REAR - END		1	1	2
SIDESWIPE			3	3
TURNING MOVEMENT		1	1	2
PARKING			3	3
NON - COLLISION				
FIXED OBJECT				
PEDESTRIAN		1		1
BACKING			6	6
MISC.				
TOTAL		3	16	19

REMARKS _____

MONTANA HIGHWAY COMMISSION

TRAFFIC DEPARTMENT

ACCIDENT ANALYSIS

COLLISION DIAGRAM

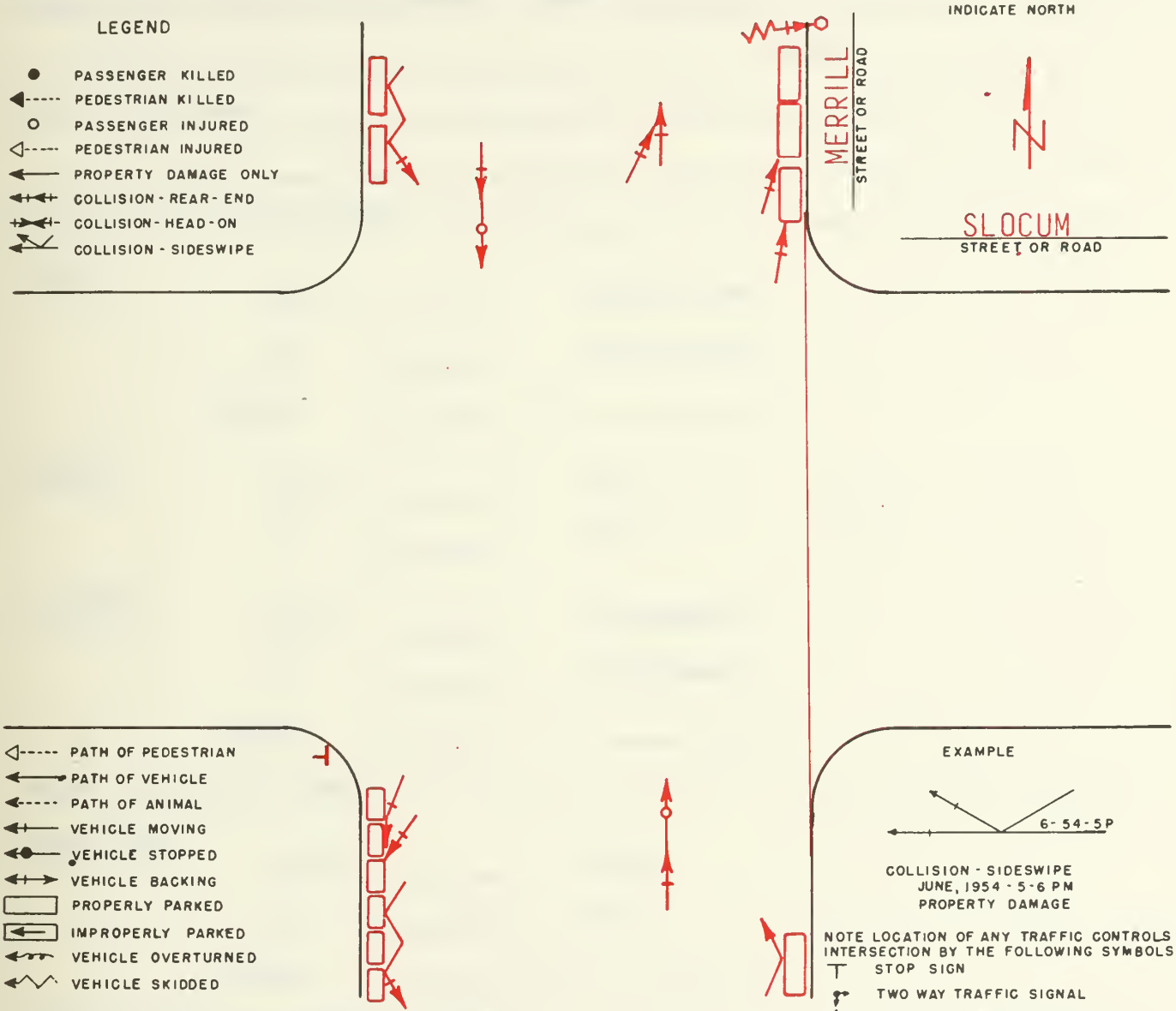
CITY OF Glendive COUNTY Dawson

INTERSECTION OF — AND

HIGHWAY NUMBER

PERIOD COVERED 6-70 6-73

COMPILED BY DRAWN BY DATE



COLLISION TYPE	TOTAL			
	FATAL	INJURY	PROP DAMAGE	TOTAL
ANGLE				
HEAD - ON				
REAR - END			2	2
SIDESWIPE			7	7
TURNING MOVEMENT				
PARKING			1	1
NON - COLLISION				
FIXED OBJECT			1	1
PEDESTRIAN				
BACKING				
MISC.				
TOTAL			11	11

REMARKS

TOPICS PROGRAM
EVALUTION PROCEDURES FOR
EFFECTIVENESS OF IMPROVEMENTS

Location _____

Analysis Area (Intersection/Section & Length) _____

_____ Length _____

Type of Improvement _____

_____

Effective Date of Improvement _____

Traffic

1970 _____ ADT/Peak Hour

19 _____ ADT/Peak Hour

Change _____ = _____%

Capacity

1970 _____ VPH L.S. = _____

19 _____ VPH L.S. = _____

Accidents

1970 _____ Rate/Number

19 _____ Rate/Number

Change _____ = _____%

Annual Savings thru Change ..... $ _____

Travel Speed

1970 _____ MPH

19 _____ MPH

Change _____ = _____%

Annual Savings thru Change ..... $ _____

AVERAGE ANNUAL MOTORIST SAVINGS
SINCE IMPLEMENTATION OF IMPROVEMENT ..... $ _____

REMARKS: _____

_____

_____

EVALUATION FORM